
INVITATION FOR BIDS (IFB)



Health Science Education Center Parking Lot Construction
IFB 2023-LairdPL008

<https://www.kilgore.edu/about/offices/procurement-services>

INVITATION FOR BIDS IFB 2023-LairdPL008
Kilgore College

Procurement Services
1100 Broadway, Kilgore, Texas 75662
Phone: 903-983-8105

Project Description: Kilgore College is accepting competitive bids in response to this Invitation for Bids 2023-LairdPL008.

The following timeline has been established to ensure that our project objective is achieved; however, the following project timeline shall be subject to change when deemed necessary by Owner.

MILESTONE	DATE
Open for Bidding	April 12, 2024
Posted/Published	April 14, 2024
Pre-Bid meeting	April 30, 2024, 10:30 a.m.
Questions Deadline	May 7, 2024, 12:00 p.m.
Close to Bidding	May 16, 2024, 10:00 a.m.
Reading of Bids Received	May 16, 2024, 10:10 a.m.
Anticipated Contractor Selection Date by KC Board	June 10, 2024
Anticipated Contract Start Date	June 12, 2024

COMPETITIVE BIDDING

A. Bids for the construction of the Health Science Education Center Parking Lot Construction project will be received until:

1. Bidding Close Date: Thursday, May 16, 2024
2. Bidding Close Time: 10:00 a.m. CST

Bids, to include all requisite documents included herein, must be submitted to the Kilgore College Procurement Services office and clearly identify the submittal deadline, the IFB number, and name and return address of the bidder. Documents received after the deadline indicated herein will not be considered. The College reserves the right to accept or reject any informality, or cancel this IFB for any reason at any time. The College will not accept bids that are delivered by telephone, facsimile (fax), or electronic mail (e-mail). Selected vendor will be required to submit Form 1295 through the Texas Ethics Commission (TEC).

B. Project Identification and Location: Kilgore College Health Science Education Center, 1612 S. Henderson Blvd., Kilgore, Texas, 75662.

C. Project Owner: Kilgore College, 1100 Broadway, Kilgore, TX 75662

D. Project Description: Work includes necessary infrastructure work and construction of a student parking lot, as detailed in provided construction documents. **Lump Sum Bid to include (but not limited to) site demolition, site clearing, earthwork, erosion and sedimentation control, soil stabilization, subgrade, paving, curbs and sidewalks, pavement markings, segmental retaining wall systems, and tree protection and removal in accordance to plans, details and project specifications contained herein. In addition to the scope of work detailed in the provided construction documents, the**

successful bidder will be responsible for:

1. **Obtaining any and all necessary permits.**
2. **Hydromulching, with Bermuda seed, adjacent areas disturbed by the construction.**
3. **Ensuring vehicular access for the East Texas Treatment Center throughout the duration of the construction project.**

Note: A bid alternative is being requested. This alternative involves the use of asphalt for the paving surface in lieu of concrete. Any curbing or sidewalks will remain concrete.

CONTRACT

Bids will be based on a lump sum contract and evaluation of selection criteria. Actual contract terms will be negotiated with the selected proposer to fit budget constraints and may not include all items of work listed herein.

CONTRACT DOCUMENTS

The following documents will be made a part of any contract for work to be performed.

- A. Site Specifications and construction documents that are included in this IFB as Attachment A.
- B. Invitation for Bids advertisement and any issued addenda can be found on the Kilgore College Procurement Services website, <https://www.kilgore.edu/about/offices/procurement-services>.
- C. Bidder's submittal/response to the Invitation for Bids.

SELECTION CRITERIA

- A. All properly submitted bids will be reviewed, evaluated, and ranked by the Owner based on the following weighted selection criteria:
 1. The bidder's proposed cost for services - 45%
 2. Qualifications and reputation of the bidder - 35%
 3. The bidder's past relationship with the College and/or design team - 10%
 4. Specific experience in the scope of the proposed project - 10%
- B. Kilgore College will select the bid that offers the best value for the College based on the above-published selection criteria and on its ranking evaluation. By submitting a bid, the bidder acknowledges (1) acceptance of the proposal evaluation process, and (2) recognition that some subjective judgments must be made by Owner during this process. In determining best value for the College, the College is not restricted to considering price alone, but may consider any other factors stated in the selection criteria that allows for the determination of the lowest responsible bidder. The Owner reserves the right to divide the project into multiple parts, to reject any and all bids and re-solicit, or to reject any and all bids and temporarily or permanently abandon the project. Owner makes no representations, written or oral, that it will enter into any form of agreement with any bidder to this solicitation and no such representation is intended or should be construed by the issuance of this solicitation. Acceptance of a bid for consideration does not waive this reservation of rights, nor does it imply any obligation by Owner.

BOARD OF TRUSTEES AWARD

A final determination of contractor selection and authorization for contract negotiations will be made by the Kilgore College Board of Trustees. Kilgore College reserves the right to reject any and all bids and waive any and all information.

PRE-BID CONFERENCE

A. April 30, 2024, at 10:30 a.m. at the project site. Please note, this site is best accessed via Dudley Road. For additional directions, please contact Mike Jenkins, mjenkins@kilgore.edu, prior to the day of the conference.

B. The pre-bid conference will allow all proposers an opportunity to ask representatives relevant questions and clarify provisions of this project. Attendance is not mandatory for bidding. Potential bidders are encouraged to attend and to visit the project site independently and prior to submitting a bid.

Answers to questions at the pre-bid meeting will be available to all bidders on the College's website at: <https://www.kilgore.edu/about/offices/procurement-services>.

QUESTIONS

All questions must be submitted, by email to Mike Jenkins (mjenkins@kilgore.edu). Deadline for submission of questions is May 7, 2024, at 12:00 p.m. Questions will be answered by the appropriate individual(s) within three (3) business days.

CLARIFICATIONS AND INTERPRETATIONS

The College may, in its sole discretion, respond in writing to written inquiries concerning this IFB. Only those responses that are made by formal written Addenda will be binding on the College. Any verbal responses, written interpretations or clarifications other than Addenda to this IFB will be without legal effect. All Addenda issued by the College prior to the submittal deadline will be and are hereby incorporated as a part of this IFB for all purposes.

Bidders are required to acknowledge receipt of each Addendum as specified in this Section. The Bidder must acknowledge all Addenda by completing, signing and returning the Addenda Checklist (ref. APPENDIX C). The Addenda Checklist must accompany the Bidder's proposal. It is the Bidder's responsibility to make sure they have obtained all addenda. Addenda, if any, will be posted on the College's website at <https://www.kilgore.edu/about/offices/procurement-services>.

TIME OF COMPLETION

Bidders shall begin the work upon receipt of the Notice to Proceed and shall complete the work within the contract time.

CONFIDENTIALITY OF DOCUMENTS

Kilgore College considers all information, documentation, and other materials requested to be submitted in response to this IFB to be of a non-confidential and/or nonproprietary nature and, therefore, shall be subject to public disclosure under Texas Public Records laws.

Any "proprietary, trade secret, or confidential commercial or financial" information must be clearly identified, in a separate sealed envelope, at the time of bid submission. The bidder will be required to fully defend, in all forums, Kilgore College's refusal to produce such information; otherwise, Kilgore College will make such information public.

GUARANTEE. SERVICES CONTRACTS AND WARRANTIES

The successful bidder will be required to guarantee under a Full-System Warranty that all work shall remain free of defects for one (1) full year after project completion. A Full-System Warranty should include labor,

workmanship, and full cost of construction. Project specifications may require further system warranties.

Manufacturer's warranties on all equipment and other architectural warranties shall be collected, bound and submitted to the Owner for their record and possible future use.

REQUIRED ELEMENTS OF THE BID DOCUMENT

Bidders must submit bids that minimally contain the information requested below.

1. **COMPLETED IFB 2023-LairdPL008 Health Science Education Center Parking Lot Construction Competitive Bidding Form** provided in Appendix B.
2. **PROJECT MANAGEMENT**
Kilgore College requires that a project manager, coordinator, or supervisor be assigned to the project to work with our Executive Director of Facility Services. The manager should be available to meet with College staff as needed. Please provide telephone and email contact information for person assigned. Kilgore College requires one (1) back-up to this person. Please provide telephone and email contact information.
3. **BIDDER QUALIFICATIONS**
Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work.

A minimum of three references for recently completed projects that are similar in nature to the proposed project should be provided.

4. **ADDENDA**
It is Bidder's responsibility to make sure they have obtained all addenda prior to submitting a bid. Addenda, if any, will be posted on Owner's website at <https://www.kilgore.edu/about/offices/procurement-services>. An Addenda Checklist form is included as Appendix C and must be completed and submitted with the bid.
5. **NON-DISCRIMINATION CLAUSE**
Bidders submitting qualifications/bids declare, promise, and warrant they have and will continue to comply fully with Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C.A. §1985, et seq.), and related state laws in that there shall be no discrimination against any employee who is employed in the performance of this contract, or against any applicant for such employment, because of age, color, national origin, race, religion, creed, disability or sex.
6. **PRICING AND PAYMENT DISBURSEMENTS/DRAW**
A detailed list of any and all expected costs or expenses should be explained. Bidder should provide a description of the desired payment schedule.

KC will not recognize or accept any charges or fees to perform the Services that are not specifically stated in the pricing bid.

The bid submitted by bidders should include a schedule of disbursements/draws required. Invoices for each disbursement/draw must be submitted for payment.

7. **INSURANCE INFORMATION**

- Bidder shall provide all insurance specified herein and shall maintain such insurance throughout the term of this Agreement.
- The insurance must be obtained from a company or companies acceptable to the Owner and licensed to transact business in the State of Texas, and have a minimum financial security rating by A.M. Best of "A-" or better, or the equivalent from any other rating system.
- The insurance specified herein is the minimum requirement. In the event bidder has or obtains insurance coverage in amounts in excess of those required herein, such additional insurance coverage shall also inure to the benefit of the Owner.
- Minimum insurance coverage to be provided by bidder:

TYPE OF COVERAGE	LIMITS OF LIABILITY
1) Worker's Compensation (part a)	Statutory
2) Employer's Liability	\$1,000,000 each occurrence
3) Commercial General Liability*	
(a) Bodily Injury	\$1,000,000 each person/\$1,000,000 each occurrence
(b) Property Damage	\$1,000,000 each occurrence/\$1,000,000 aggregate
4) Comprehensive Vehicle Liability	
(a) Bodily Injury	\$1,000,000 each person/\$1,000,000 each occurrence
(a) Property Damage	\$1,000,000 each occurrence

*The Kilgore Junior College District shall be named as an additional insured party on Bidder's General Liability policy.

8. CERTIFICATE OF INSURANCE

The bidder shall furnish the College with a certificate(s) of insurance evidencing the coverages required in this section. Such certificate(s) shall specifically state that the insurance company or companies underwriting these insurance coverages shall give the College at least thirty (30) days' written notice in the event of cancellation of, or material change in, any of the coverages. If the certificate(s) is shown to expire prior to completion of all the terms of this Contract, the bidder shall furnish a certificate(s) of insurance evidencing renewal of its coverage to the College.

The bidder shall require each and every subcontractor performing work under the contract to maintain the same coverages required of the bidder in this Section, and upon the request of the College, shall furnish the College with a certificate(s) of insurance evidencing the subcontractor's insurance coverages required in this section.

9. EXECUTION OF OFFER

Bidder must complete, sign and return the attached Execution of Offer (Appendix D) as part of its bid. The Execution of Offer must be signed by a representative of bidder duly authorized to bind the bidder to its bid. Any bid received without a completed and signed Execution of Offer may be rejected by KC, in its sole discretion.

CONFLICT OF INTEREST CLAUSE

The parties hereto declare and affirm that no officer, member, or employee of the College, and no member of its governing body exercises any functions or responsibilities in the review or approval of the undertaking described in this Contract, or the performing of services pursuant to this Contract, shall

participate in any decision relating to this Contract which affects his or her personal interest, or any corporation, partnership, or association in which he or she is directly or indirectly interested; nor shall any employee of the College, nor any member of its governing body, have any interest, direct or indirect, in this Contract or the proceeds thereof.

BREACH

Should the bidder breach, violate, or abrogate any term, condition, clause or provision of this agreement, the College shall notify the Company in writing that such an action has occurred. If satisfactory provision does not occur within ten (10) days from such written notice the College may, at its option, terminate this agreement and obtain an alternate provider to provide all required materials. This provision shall not preclude the pursuit of other remedies for breach of contract as allowed by law.

INDEMNIFICATION

To the fullest extent permitted by law, contractor will and does hereby agree to indemnify, protect, defend with counsel approved by kc, and hold harmless kc, and their respective affiliated enterprises, board of trustees, officers, directors, attorneys, employees, representatives and agents (collectively "indemnitees") from and against all damages, losses, liens, causes of action, suits, judgments, expenses, and other claims of any nature, kind, or description, including reasonable Attorneys' fees and costs incurred in investigating, defending or settling any of the foregoing (collectively "claims") by any person or entity, arising out of, caused by, or resulting from contractor's performance under or breach of this agreement and that are caused in whole or in part by any malpractice, negligent act, negligent omission or willful misconduct of contractor, anyone directly employed by contractor or anyone for whose acts contractor may be liable. The provisions of this section will not be construed to eliminate or reduce any other indemnification or right which any indemnitee has by law or equity.

FORCE MAJEURE

The performance of either party's obligations will be suspended to the extent and for the length of time that the party is prevented from performing due to acts of nature, fires, governmental actions, changes in the Service requirements which directly contribute to a delay, or other events beyond its reasonable control. In the event of any occurrence that a party considers to be the cause of a delay or failure of performance, the party affected shall promptly notify the other party.

ISRAEL

In accordance with the Texas Government Code, Proposer represents and verifies that it does not, and will not during the term of the contract, if awarded, boycott Israel and that Proposer is not identified by the Texas Comptroller as boycotting Israel. "Boycott" as used herein means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes

APPENDIX A

Appendix A consists of site specifications and construction documents.

SECTION 02-4113

SITE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Demolition of structures, paving, and utilities.
 - 2. Filling voids created as a result of removals or demolition.
- B. Related Sections
 - 1. Section 31-1000 – Site Clearing
 - 2. Section 31-3200 – Earthwork

1.2 REGULATORY REQUIREMENTS

- A. Conform to applicable State and local codes for demolition of structures, safety of adjacent structures, dust control, and runoff control.
- B. Obtain required permits and licenses from appropriate authorities. Pay associated fees including disposal charges.
- C. Notify affected utility companies before starting work and comply with their requirements.
- D. Do not close or obstruct public or private roadways, sidewalks, or fire hydrants without appropriate permits or written authorization.
- E. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.
- F. Test soils around buried tanks for contamination.

1.3 SUBMITTALS

- A. Project Record Documents: Accurately record actual locations of capped utilities and subsurface obstructions that will remain after demolition. Submit record as part of closeout submittals.

1.4 PROJECT CONDITIONS

- A. Structures to be demolished will be discontinued in use and vacated prior to start of work.
- B. Owner assumes no responsibility for condition of structures to be demolished.
- C. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as reasonably practical. Variations within structures may occur by Owner's removal and salvage operations prior to start of demolition work.
- D. Unless otherwise indicated in Contract Documents or specified by the Owner, items of salvageable value to Contractor shall be removed from site and structures. Storage or sale of removed items on site will not be permitted and shall not interfere with other work specified.
- E. Explosives shall not be brought to site or used without written consent of authorities having jurisdiction. Such written consent will not relieve Contractor of total responsibility for injury to persons or for damage to property due to blasting operations. Performance of required blasting shall comply with governing regulations.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Fill material shall be Select Fill or aggregate fill materials as specified in Section 31-2000.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Provide, erect, and maintain erosion control devices, temporary barriers, and security devices at locations indicated on Construction Drawings.
- B. Protect existing landscaping materials, appurtenances, and structures which are not to be demolished. Repair damage to existing items to remain caused by demolition operations.
- C. Prevent movement or settlement of adjacent structures. Provide bracing and shoring as necessary.
- D. Mark location of utilities. Protect and maintain in safe and operable condition utilities that are to remain. Prevent interruption of existing utility service to occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities as acceptable to governing authorities and Owner. Locations of all known underground utility lines within the limits of construction, as shown on the construction drawings, were derived from best available record documents pertaining to the original site construction and, when available, as marked on the ground by the local utility companies. Owner and Engineer make no warranties as to the accuracy of information regarding buried utilities shown on said construction documents. Contractor shall exercise caution during all excavation and grading activities to avoid damage to utilities shown to remain active and shall notify Owner and Engineer immediately of any discrepancies found regarding actual location, depth, size and/or type of buried utility pipes, wires and conduits so that appropriate measures can be taken to relocate those that must remain active.
- E. Notify adjacent property owners of work that may affect their property, potential noise, utility outages, or other disruptions. Obtain written permission from adjacent property owners when demolition equipment will traverse, infringe upon, or limit access to their property. Coordinate notice with Owner.

3.2 GENERAL DEMOLITION REQUIREMENTS

- A. Conduct demolition to minimize interference with adjacent structures or pavements to remain.
- B. Cease operations immediately if adjacent structures appear to be in danger. Notify authority having jurisdiction. Do not resume operations until directed by authority.
- C. Conduct operations with minimum of interference to public or private access. Maintain ingress and egress at all times.
- D. Sprinkle work with water to minimize dust. Provide hoses and water connections for this purpose.
- E. Comply with governing regulations pertaining to environmental protection.
- F. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.

3.3 DEMOLITION

- A. Demolish site improvements designated to be removed as shown on the drawings. Site improvements shall include but not be limited to structures, retaining walls, foundations, pavements, curbs and gutters, drainage structures, utilities, signage or landscaping.
- B. Disconnect and cap or remove utilities to be abandoned as shown on the drawings.
- C. Fill or remove underground tanks, piping, and appurtenances as shown.
- D. Demolish buildings completely and remove from site using methods as required to complete work within limitations of governing regulations. Small structures may be removed intact when acceptable to Owner and authorities having jurisdiction.
- E. Locate demolition equipment and remove materials to prevent excessive loading to supporting walls, floors, or framing.
- F. Demolish concrete and masonry in small sections. Break up concrete slabs-on-grade that are 2-feet or more below proposed subgrade to permit moisture drainage. Remove slabs-on-grade and below grade construction within 2-feet of proposed subgrade.

3.4 FILLING BASEMENTS AND VOIDS

- A. Completely fill below grade areas and voids resulting from demolition or removal of structures, underground fuel storage tanks, wells, cisterns, etc., using Select Fill or aggregate fill materials consisting of stone, gravel or sand. Backfill materials shall be free from demolition rubble or debris, trash, frozen materials, roots and other organic matter.
- B. Areas to be filled shall be free of standing water, frost, frozen or unsuitable material, trash, and debris prior to fill placement.
- C. Unless stated otherwise in the Geotechnical Report and/or Section 31-2000, contractor shall remove upper 12 inches (minimum) of in situ materials remaining beneath floors or basement cavities if found by the geotechnical engineer to be unsuitable. Scarify and re-compact the upper 8-inches of existing soils to minimum 95 percent of the maximum density in accordance with ASTM D 698 (Standard Proctor) prior to placing any fill.
- D. Place fill materials in accordance with Section 31-2000 unless subsequent excavation for new work is required.
- E. Grade surface to match adjacent grades and to provide flow of surface drainage after fill placement and compaction.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from site debris, rubbish, and other materials resulting from demolition operations. Leave areas of work in clean condition.
- B. No burning of any material, debris, or trash on-site or off-site will be allowed except when allowed by appropriate governing authority and Owner. If allowed as stated above, burning shall be performed in manner prescribed by governing authority. Attend burning materials until fires have burned out and have been completely extinguished.
- C. Transport materials removed from demolished structures with appropriate vehicles and dispose off-site to areas that are approved for disposal by governing authorities and appropriate property owners.

END OF SECTION

SECTION 10-1453

TRAFFIC SIGNS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Traffic control signs.

1.2 REFERENCES

- A. American Standard for Testing Materials (ASTM)
 - 1. ASTM C94 - Ready Mix Concrete
- B. US Department of Transportation, Federal Highway Administration
 - 1. Manual on Uniform Traffic Control Devices (MUTCD).
- C. Texas Department of Transportation (TxDOT) – Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Latest Edition). References within these specifications (and/or on the Construction Drawings) to various item (or section) numbers from State DOT specifications are for purposes of additional information only; where conflicts may exist, the project specifications herein shall supersede the referenced State DOT specs. General requirements of the State DOT specifications as related to bid award, contract execution, scope of work, measurement and payment shall not be binding on this project unless otherwise specified in writing.

PART 2 - PRODUCTS

2.1 SIGNS: Conform to the following and MUTCD classification is shown in parentheses:

- A. "STOP" Signs: 30-inches x 30-inches, Octagon, white legend and border on red background (R1-1)
- B. "YIELD" Signs: 36-inches x 36-inches x 36-inches, Triangle, red legend and border band with white interior (R1-2)
- C. "RESERVED (Accessible) PARKING" Signs (with symbol): 12-inches x 18-inches, green legend and border, white symbol on blue box, and white background (R7-8)
- D. "PED XING" Signs: 30-inches x 30-inches, black legend and border on yellow background (W11-2)
- E. Miscellaneous Signs: See Construction Drawings

2.2 POSTS

- A. "U" channel galvanized steel posts with galvanized sign-mounting hardware for each sign. Posts shall have a weight of 2-pounds per lineal foot.
- B. Galvanized steel pipe, 2.375-inch diameter, with welded cap; 2 each galvanized or aluminum sign-mounting clamps for each sign panel.
- C. Two-piece breakaway-type posts only when required by jurisdiction and as shown on Construction Drawings.

2.3 CONCRETE

- A. Mix concrete and deliver in accordance with ASTM C94.
- B. Design mix to produce normal weight concrete consisting of Portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce following:
 - 1. Compressive Strength: 3,500 psi, minimum at 28 days, unless otherwise indicated on Construction Drawings.
 - 2. Slump Range: 1 to 3-inches at time of placement
 - 3. Air Entrainment: 4 to 6 percent

PART 3 - EXECUTION

3.1 PREPARATION

- A. Contractor shall field verify underground utilities prior to sign installation. Primary utilities of concern of shallow depths are lawn sprinkler systems, electric, telephone, fiber optic, cable and gas.
- B. Cost related to repair of damaged surface and subsurface facilities shall be paid for by the Contractor at no additional expense to the Owner.

3.2 INSTALLATION

- A. Install posts in 18-inch diameter x 24-inch deep concrete foundations. Set posts vertical and plumb with bottom of sign at minimum 7'-0" above finish grade unless otherwise indicated on the Construction Drawings. Mount signs in accordance with manufacturer's instructions, except that when utilizing round posts, sign-mounting brackets shall be installed.

END OF SECTION

SECTION 31-1000

SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Cleaning site of debris, grass, trees, and other plant life in preparation for site or building earthwork.
 - 2. Protection of existing structures, trees, or vegetation indicated on the Construction Drawings to remain.
- B. Related Sections
 - 1. Section 02-4113 – Site Demolition
 - 2. Section 31-2000 – Earthwork
 - 3. Section 31-2500 – Storm Water Pollution Prevention Plan (SWPPP) and details.

1.2 ENVIRONMENTAL REQUIREMENTS

- A. Construct temporary erosion control systems as shown on Construction Drawings or as directed by the Storm Water Pollution Prevention Plan (SWPPP) to protect adjacent properties and water resources from erosion and sedimentation.
- B. In event that sitework on this project will disturb more than 5 acres, Contractor shall not begin construction without filing a Construction Notice Of Intent (NOI) to the Texas Commission on Environmental Quality (TCEQ) for a Texas Pollution Discharge Elimination System (TPDES) permit governing discharge of storm water from the site for entire construction period. If site-work will disturb less than 5 acres, but more than 1 acre, Contractor shall file a Construction Site Notice (CSN) with TCEQ. In each case, the TPDES permit requires SWPPP to be in place during construction with all notices and documentation kept on site. Refer to the TCEQ website (www.tceq.state.tx.us) for complete permitting details.
- C. Contractor shall conduct storm water management practices in accordance with TPDES permit and shall enforce action taken or imposed by Federal or State agencies, including cost of fines, construction delays, and remedial actions resulting from Contractor's failure to comply with provisions of TPDES permit.

1.3 PROJECT CONDITIONS

- A. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as reasonably practical.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify existing plant life that is to remain and verify clearing limits are clearly tagged, identified, and marked in such manner as to ensure their protection throughout construction operations.

3.2 PROTECTION

- A. Locate, identify, and protect existing utilities that are to remain.
- B. Protect trees, plant growth, and features designated to remain as part of final landscaping. Erect high-visibility orange construction fencing beneath the dripline of any existing trees designated to remain; storage of materials and vehicle access beneath the dripline of trees to remain shall be prohibited. Where proposed excavation, pavements or structures shall occur within the dripline of any tree to remain, contractor shall prune roots with a rock saw along a line within 12" to 18" beyond the limits of the future excavation, paving or structure.
- C. Conduct operations with minimum interference to public or private accesses and facilities. Maintain ingress and egress at all times and clean or sweep roadways daily as required by SWPPP or governing authority. Dust control shall be provided with sprinkling systems or equipment provided by Contractor.
- D. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by a licensed land surveyor and replaced, as necessary, in kind.
- E. Provide traffic control as required, in accordance with the US Department of Transportation's "Manual on Uniform Traffic Control Devices" and applicable state highway department requirements.

3.3 EQUIPMENT

- A. Material shall be transported to and from the project site using well-maintained and operating vehicles. Transporting vehicles operating on site shall stay on designated haul roads and shall not endanger improvements by rutting, overloading, or pumping.

3.4 CLEARING

- A. Clear areas required for access to site and execution of work. When possible, clearing of the entire site at one time shall be avoided in favor of staging clearing operations as new construction sequence of operations dictates.
- B. Unless otherwise indicated on Construction Drawings, remove trees, shrubs, grass, other vegetation, improvements, or obstructions interfering with installation of new construction. Removal includes digging out stumps and roots. Depressions caused by clearing and grubbing operations shall be filled to subgrade elevation to avoid ponding of water. Satisfactory fill material shall be placed in accordance with Section 31-2000.
- C. Remove grass, trees, plant life, stumps, and other construction debris from site to dump site that is suitable for handling such material according to state laws and regulations.
- D. Cut heavy growths of grass from areas before stripping and topsoil removal and remove cuttings with remainder of cleared vegetative material.

END OF SECTION

SECTION 31-2000

EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Excavation, filling, and backfilling for structures and on-site pavement.
 2. Trenching and backfilling for utilities.
 3. Dewatering.
 4. Boring under crossings.
- B. Related Sections
1. Section 31-3200 – Soil Stabilization
 2. Section 31-2500 – Storm Water Pollution Prevention Plan (SWPPP) and details
 3. Section 31-3700 – Stone Protection
 4. Landscape Planting specifications (by others).

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM)
1. ASTM D 422 – Standard Test Method For Particle Size Analysis of Soil
 2. ASTM D 448 – Standard Classification for Sizes of Aggregate for Road and Bridge Construction
 3. ASTM D 698 – Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN.m/m³))
 4. ASTM D 1557 – Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 Kn.m/m³))
 5. ASTM D 2321 – Standard Practice for Underground Installation of Thermoplastic Pipe
 6. ASTM D 2487 – Unified Soil Classification System
 7. ASTM D 2940 – Graded Aggregate Material for Bases or Subbases for Highways or Airports
 8. ASTM D 4318 – Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 9. ASTM D 6938 – In-Place Density and Water Content or Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- B. American Association of State Highway and Transportation Officials (AASHTO)
1. AASHTO T88 – Particle Size Analysis of Soils
 2. AASHTO T180 – Standard Method of Test for Moisture-Density Relationships of Soils
- C. Texas Department of Transportation (TxDOT) – Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Latest Edition). References within these specifications (and/or on the Construction Drawings) to various item (or section) numbers from State DOT specifications are for purposes of additional information only; where conflicts may exist, the project specifications herein shall supersede the referenced State DOT specs. General requirements of the State DOT specifications as related to bid award, contract execution, scope of work, measurement and payment shall not be binding on this project unless otherwise specified in writing.
- D. National Fire Protection Association (NFPA)
1. NFPA 70 – National Electrical Code
- E. American Water Works Association (AWWA)
1. AWWA C200 – Standard For Steel Water Pipe - 6 In. (150 Mm) And Larger
 2. AWWA C206 – Field Welding Of Steel Water Pipe

1.3 QUALITY ASSURANCE

- A. An Independent Testing Laboratory will be retained to perform construction testing on site.
 - 1. The Independent Testing Laboratory shall prepare test reports that indicate test location, elevation data, and test results. Owner, Engineer and Contractor shall be provided with copies of reports within 96 hours of time that test was performed. In event that test performed fails to meet Specifications, the independent testing laboratory shall notify Owner and Contractor immediately.
 - 2. Costs related to retesting due to failures shall be paid for by the Contractor at no additional expense to Owner. Contractor shall provide free access to site for testing activities.
 - 3. Quality assurance testing will be conducted in accordance with Paragraph "Field Testing" in Part 3 hereinafter.

1.4 DEFINITIONS

- A. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SM, SW, SP, SC and CL, or a combination of these group symbols, subject to the limitations and requirements for use set forth in the geotechnical report (Project No. B2101566 by Braun Intertec), and being free of rock or gravel larger than allowed for fill or backfill material as specified hereinafter or as shown on the drawings. Satisfactory soil shall contain no debris, waste, frozen materials, vegetation, and other deleterious matter.
- B. Unsatisfactory Materials: Materials which do not comply with the requirements for satisfactory materials are unsatisfactory including materials classified in ASTM D 2487 soil classification groups GC, ML, MH, CH, OL, OH, and PT, or a combination of these group symbols.
 - 1. Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic matter or frozen material. The Owner shall be notified of any contaminated materials.
 - 2. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- C. Select Fill: Materials complying with "Satisfactory Soils" listed above, and in accordance with the above-referenced geotechnical report recommendations. Select fill shall be free of organics or other deleterious materials, homogeneous mixture, have a maximum particle size of 3 inches, liquid limit less than 35, plasticity index between 7 and 18, and a maximum of 60% passing the No. 200 sieve. Select fill shall be comprised of low plasticity sandy clays (CL) or clayey sands (SC). Note that some on-site materials generally comply with the above criteria, while some do not appear to be suitable for select fill; careful segregation of materials during excavation will be required, or a source for import select fill will be necessary for this project.
- D. Compacted Stable Subgrade: As defined in the geotechnical report, the upper 8 inches of existing soil subgrade beneath all pavement sections shall meet the following requirements:
 - 1. Shall pass proof roll test for stability under load in accordance with TxDOT Item 216
 - 2. May be fill material and/or in situ soils with Plasticity Index between 0 and 20
 - 3. Shall be scarified, moisture content adjusted to within plus or minus 2 percent of optimum, and compacted to minimum 95 percent of maximum density per ASTM D 698
 - 4. May not be comprised of Unsatisfactory Materials as defined herein
 - 5. If Plasticity Index is less than 7 and planned grade exceeds 4 percent, replace existing soils with select fill
 - 6. If Plasticity Index is greater than 20, chemically stabilize or replace existing soils with select fill

1.5 SUBMITTALS

- A. Submit 30-pound sample of each type of off-site fill material that is to be used at the site in airtight containers to the Independent Testing Laboratory or submit gradation and certification of aggregate material that is to be used at the site to the independent testing laboratory for review.

- B. Submit certification that all material obtained from off-site sources complies with specification requirements.
- C. Submit name of each material supplier and specific type and source of each material. Change in source throughout project requires approval of Owner.
- D. If fabrics or geogrids are to be used, design shall be submitted for approval to Owner.
- E. Submit Dewatering Plans upon request by Owner.
- F. Shop drawings or details pertaining to excavating and filling are not required unless otherwise shown on the Drawings or if contrary procedures to Construction Documents are proposed.
- G. Shop drawings or details pertaining to site utilities are not required unless required by regulatory authorities or unless uses of materials, methods, equipment, or procedures that are contrary to The Drawings or Specifications are proposed. Do not perform work until Owner has accepted required shop drawings.
- H. Contact utility companies and determine if additional easements will be required to complete project. Provide written confirmation of the status of all easements to Owner at time of Preconstruction Conference.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Fill and Backfill. Satisfactory soil materials excavated from the site (see 1.4, above). Lean clay (CL) and fat clay (CH) soils shall not be utilized as backfill for walls above or below grade, including retaining and stem walls.
- B. Imported Fill Material: Satisfactory borrow material provided from offsite borrow areas when sufficient satisfactory soil materials are not available from required excavations.
- C. Trench Backfill: ASTM D 2321 unless otherwise specified or shown on the drawings.
- D. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve. Refer to Section 32-1100 for base requirements for all paving sections.
- F. Bedding: Aggregate Type as indicated on the plans or naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- G. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch sieve and 0 to 5 percent passing a No. 8 sieve.
- H. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1- inch sieve and 0 to 5 percent passing a No. 4 sieve.

- I. Topsoil: Topsoil shall consist of stripping material excavated from the site. Topsoil shall consist of organic surficial soil found in depth of not more than 6-inches. Topsoil shall be as further defined in Landscape Planting specifications (by others).
- J. Stabilization fabrics and geogrids: As specified in Section 31-3200 unless otherwise shown on Construction Drawings.
- K. Filter and drainage fabrics: As specified in Section 31-2500 unless otherwise shown on Construction Drawings.
- L. Steel Casing Pipe: Comply with AWWA C200 minimum grade B, size, and wall thickness as indicated on the Drawings.
- M. Trench Utility Locator Tape: Heavy duty 6" wide underground warning tape. Tape shall be made from polyethylene material, 3.5 mils thick, with a minimum tensile strength of 1,750 psi. Place the tape at one-half the minimum depth of cover for the utility line or a maximum of 3 feet, whichever ever is the less, but never above the top of subgrade. Color of tape shall be determined by as follows:
 - 1. Natural Gas or Propane - Yellow
 - 2. Electric - Red
 - 3. Telephone – Orange
 - 4. Water – Blue
 - 5. Sanitary Sewer – Green

2.2 EQUIPMENT

- A. Transport off-site materials to project using well-maintained and operating vehicles. Once on site, transporting vehicles shall stay on designated haul roads and shall at no time endanger improvements by rutting, overloading, or pumping.

2.3 SOURCE QUALITY CONTROL

- A. Laboratory testing of materials proposed for use in the project shall be by the Independent Testing Laboratory at no cost to Contractor, unless otherwise specified within the Contract Documents. The Contractor shall provide samples of material obtained off-site.
- B. In areas to receive pavement, California Bearing Ratio (CBR) tests shall be performed for each type of material that is imported from off-site. CBR value shall be equal to or above pavement design subgrade CBR value indicated on Construction Drawings
- C. Following tests shall be performed on each type of on-site or imported soil material used as compacted fill:
 - 1. Moisture and Density Relationship: ASTM D 698 or ASTM D 1557.
 - 2. Mechanical Analysis: AASHTO T88 or ASTM D 422.
 - 3. Plasticity Index: ASTM D 4318

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify required lines, levels, contours, datum, elevations, and grades necessary for construction as shown on the drawings.
- B. Notify utility companies to remove or relocate public utilities that are in conflict with proposed improvements.
- C. Protect plant life, lawns, fences, existing structures, sidewalks, paving, and curbs, unless otherwise noted on the drawings from excavating equipment and vehicular traffic.

- D. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.
- E. Remove from site, material encountered in grading operations that, in opinion of Owner or the Independent Testing Laboratory, is unsuitable or undesirable for backfilling, subgrade, or foundation purposes. Dispose of unsuitable materials in manner satisfactory to Owner. Backfill areas with layers of suitable material and compact as specified herein.
- F. Prior to placing fill in low areas, such as previously existing creeks, ponds, or lakes, perform following procedures:
 - 1. Drain water out by gravity with ditch having flow line lower than lowest elevation in low area. If drainage cannot be performed by gravity ditch, use adequate pump to obtain the same results.
 - 2. After drainage of low area is complete, remove muck, mud, debris, and other unsuitable material by using acceptable equipment and methods that will keep natural soils underlying low area dry and undisturbed.
 - 3. All muck, mud, and other materials removed from low areas shall be dried on-site by spreading in thin layers for observation by the Independent Testing Laboratory. Material shall be inspected and, if found to be suitable for use as fill material, shall be incorporated into lowest elevation of site filling operation, but not under building subgrade or within 10'-0" of perimeter of building subgrade or paving subgrade. If, after observation by the Independent Testing Laboratory, material is found to be unsuitable, unsuitable material shall be removed from site or disposed of on-site at locations determined by the Engineer and the Owner's Representative.
- G. Locate and identify existing utilities that are to remain and protect from damage.
- H. Maintain in operating condition existing utilities, previously installed utilities, and drainage systems encountered in utility installation. Repair surface or subsurface improvements shown on The Drawings.
- I. Verify location, size, elevation, and other pertinent data required for making connections to existing utilities and drainage systems as indicated on The Drawings.
- J. Over-excavate and properly prepare areas of subgrade that are not capable of supporting proposed systems. Stabilize these areas by using acceptable geotextile fabrics, geogrids and/or aggregate material placed and compacted as specified in Section 31-3200. In accordance with the geotechnical report, the Kilgore College Health and Science Building (Area 1) foundation shall be supported by a minimum of three and one-half feet (3.5') and the Christus Good Shepherd Clinic Addition (Area 2) building foundation shall be supported by a minimum of four and one-half feet (4.5') of select fill, which will require overexcavation of existing soils beneath finished subgrade elevations. Prior to replacement of the select fill, these exposed areas shall be proofrolled, scarified, processed and recompacted as described herein.

3.2 DEWATERING

- A. General:
 - 1. Design and provide dewatering system as required for excavations using accepted and professional methods consistent with current industry practice to eliminate water entering the excavation under hydrostatic head from the bottom or sides. Provide dewatering system of sufficient size and capacity to prevent ground and surface water flow into the excavation and to allow Work to be installed in a dry condition.
 - 2. Install wells or wellpoints, if required, with suitable screens and filters so that continuous pumping of fines does not occur. Arrange discharge to facilitate collection of samples by the Owner.
 - 3. Control grading around excavations to prevent surface water from flowing into excavation areas.

- B. Design:
 - 1. Designate and obtain the services of a qualified dewatering specialist to provide dewatering plan as may be necessary to complete the Work.
 - 2. Contractor shall be responsible for the accuracy of the drawings, design data, and operational records required.
 - 3. Contractor shall be responsible for the design, installation, operation, maintenance, and any failure of any component of the system.
- C. Maintaining Excavation in Dewatering Condition:
 - 1. Dewatering shall be a continuous operation. Interruptions due to power outages or any other reason will not be permitted.
 - 2. Continuously maintain excavation in a dry condition with positive dewatering methods during preparation of subgrade, installation of pipe, and construction of structures until the critical period of construction or backfill is completed to prevent damage of subgrade support, piping, structure, side slopes, or adjacent facilities from flotation or other hydrostatic pressure imbalance.
- D. System Removal: Upon completion of the work, remove dewatering equipment from the site, including related temporary electrical service.
- E. Wells shall be removed or cut off a minimum of 3 feet below final ground surface, capped, and abandoned in accordance with regulations by agencies having jurisdiction.

3.3 TOPSOIL EXCAVATION

- A. Cut heavy growths of grass from areas before stripping and remove cuttings with remainder of cleared vegetative material.
- B. Strip topsoil to a depth of not less than 6 inches from areas that are to be filled, excavated, landscaped, or re-graded to such depth that it prevents intermingling with underlying subsoil or questionable material.
- C. Stockpile topsoil in storage piles in areas shown on The Drawings or where directed by Owner. Construct storage piles to freely drain surface water. Cover storage piles as required to prevent windblown dust. Dispose of unsuitable topsoil as specified for waste material, unless otherwise specified by Owner. Remove excess topsoil from site unless specifically noted otherwise on The Drawings.

3.4 GENERAL EXCAVATION

- A. Classification of Excavation: The Contractor shall assure himself by site investigation or other necessary means that he is familiar with the type, quantity, quality, and character of excavation work to be performed. Excavation shall be considered unclassified excavation, except as indicated in the Contract Documents.
- B. When performing grading operations during periods of wet weather, provide adequate dewatering, drainage and ground water management to control moisture of soils. During the geotechnical field investigations, groundwater seepage was encountered in four (4) of the nine (9) borings at depths as shallow as eighteen feet (18') upon completion, as noted in the geotechnical report. It is possible that groundwater elevations may fluctuate and/or become perched at shallower depths. Shallow groundwater may be encountered at other locations during excavation and trenching.
- C. Shore, brace, and drain excavations as necessary to maintain excavation as safe, secure, and free of water at all times.
- D. Excavate building areas to line and grade as shown on the Drawings being careful not to over excavate beyond elevations needed for building subgrades. As stated previously in 3.1(j)

herein, over-excavation of sufficient depth to allow for placement of three and one-half feet (3.5') of select fill beneath the Kilgore College Health and Science Building and four and one-half feet (4.5') select fill beneath the Christus Good Shepherd Clinic Addition shall be required.

- E. Place suitable excavated material into project fill areas. The Kilgore College Health and Science Building foundation shall be supported by a minimum of three and one-half feet (3.5') and the Christus Good Shepherd Clinic Addition (Area 2) building foundation shall be supported by a minimum of four and one-half feet (4.5') of select fill, as stated in the geotechnical report.
- F. Unsuitable excavated material shall be disposed of in manner and location that is acceptable to Owner and local governing agencies.
- G. Perform excavation using capable, well-maintained equipment and methods acceptable to Owner and local governing agencies.

3.5 ROCK EXCAVATION (Not Used)

3.6 TRENCHING EXCAVATION FOR UTILITIES

- A. Contact local utility companies before excavation begins. Dig trench at proper width and depth for laying pipe, conduit, or cable. Cut trench banks vertical, if possible, and remove stones from bottom of trench as necessary to avoid point-bearing. Over excavate wet or unstable soil, if encountered, from trench bottom as necessary to provide suitable base for continuous and uniform bedding. Replace overexcavation with suitable and dispose of unsuitable material.
- B. Trench excavation sidewalls shall be sloped, shored, sheeted, braced, or otherwise supported by means of sufficient strength to protect workmen in accordance with applicable rules and regulations established for construction by the Department of Labor, Occupational Safety and Health Administration (OSHA), and by local ordinances. Lateral travel distance to exit ladder or steps shall not be greater than 25 feet in trenches 4 feet or deeper.
- C. Perform trench excavation as indicated on the Drawings for specified depths. During excavation, stockpile materials suitable for backfilling in orderly manner far enough from bank of trench to avoid overloading, slides, or cave-ins.
- D. Remove excavated materials not required or not suitable for backfill or embankments and waste off-site or at on-site locations approved by the Owner and in accordance with governing regulations. Dispose of structures discovered during excavation as specified in Section 02-4113.
- E. Prevent surface water from flowing into trenches or other excavations by temporary grading or other methods, as required. Remove accumulated water in trenches and other excavations as specified.
- F. Open cut excavation with trenching machine or backhoe. Where machines other than ladder or wheel-type trenching machines are used, do not use clods for backfill.
- G. Accurately grade trench bottom to provide uniform bearing and support for each section of pipe on bedding material at every point along entire length except where necessary to excavate for bell holes, proper sealing of pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make joint connection properly.
- H. Trench width below top of pipe shall not be less than 12 inches nor more than 18 inches wider than outside surface of pipe or conduit that is to be installed to designated elevations and grades. Other trench width for pipe, conduit, or cable shall be least practical width that will allow for proper compaction of trench backfill.

- I. Trench depth requirements measured from finished grade or paved surface shall meet the following requirements or applicable codes and ordinances, whichever is more stringent:
 1. Water Mains: 30 inches to top of pipe barrel or 6 inches below frost line, established by local building official, whichever is deeper.
 2. Sanitary Sewer: Elevations and grades as indicated on the drawings and as specified in Section 33-3100.
 3. Storm Sewer: Elevations and grades as indicated on the Drawings.
 4. Electrical Conduits: 24 inches minimum to top of conduit or as required by NEC 300-5, NEC 710-36 codes, or local utility company requirements, whichever is deeper.
 5. TV Conduits: 18 inches minimum to top of conduit or as required by local utility company, whichever is deeper.
 6. Telephone Conduits: 18 inches minimum to top of conduit, or as required by local utility company, whichever is deeper.
 7. Gas Mains and Service: 30 inches minimum to top of pipe, or as required by local utility company, whichever is deeper.

3.7 SUBGRADE PREPARATION

- A. Scarification and Compaction: Areas exposed by excavation or stripping and on which subgrade preparations are to be performed shall be scarified to minimum depth of eight (8) inches and compacted as specified hereinafter.
- B. Proofrolling: Subgrades shall be proofrolled to detect areas of insufficient compaction. After stripping, undercutting, and excavation and vibratory rolling (in accordance with the Grading Plan and geotechnical report), proofrolling in all building and pavement areas shall be performed in accordance with TxDOT Item 216 while under the supervision and direction of the Independent Testing Laboratory or geotechnical engineer. Document and explain proofrolling inspection procedures and results in the laboratory inspection report. Areas of failure shall be excavated and recompacted as specified herein. Continual failure areas shall be stabilized in accordance with Section 31-3200 at no additional cost to Owner. Subgrade exposed longer than 48 hours, or on which precipitation has occurred, may require additional proofroll testing prior to placement of base materials, paving or slabs.
- C. After stripping, excavating (where required) and proof-rolling, but prior to placing fill, exposed soils shall be scarified to a depth of eight (8) inches, processed to a moisture content between two percent (2%) below and two percent (2%) above Standard Proctor optimum, then recompacted to a dry density of at least 95 percent of the Standard Proctor maximum dry density. In addition to density testing, all footing locations shall be hand-probed by the Independent Testing Laboratory prior to placement of steel reinforcing.
- D. In all pavement areas, the upper eight inches (8") of subgrade shall consist of one of the following: (i) in-situ native soils having a plasticity index (PI) of 20 or less, (ii) in-situ native soils with PI value greater than 20, chemically-stabilized to reduce PI to 15 or less (in accordance with Section 31-3200), or (iii) select fill as defined herein.

3.8 FILLING

- A. Fill areas to contours and elevations shown on the Drawings with unfrozen materials.
- B. Place fills in continuous lifts specified herein in areas that have been prepared according to 3.7 (above).
- C. Fill within proposed building subgrade and paving subgrade shall not contain rock or stone greater than 6 inches in any dimension.
- D. Unless otherwise specified for rock fill, rock or stone less than 6-inches in largest dimension may be used in fill below structures, paving, and graded areas, up to 24 inches below surface of proposed subgrade (or finish grade of graded areas) when mixed with suitable material. Rock or

stone less than 2 inches in largest dimension may be used in fill within the upper 24 inches of proposed subgrade or finish grade of graded areas when mixed with suitable material.

- E. Fill materials used in preparation of subgrade shall be placed in lifts or layers not to exceed 8 inches loose measure and compacted as specified hereinafter. Where differing depths of fill soils are required beneath structures, they shall be transitioned at 10:1 (horizontal to vertical) or flatter slopes.
- F. Material imported from off-site shall have CBR value equal to or above pavement design subgrade CBR value indicated on the Drawings.
- G. Building area subgrade pad shall be that portion of site directly beneath and 5 feet beyond building and appurtenances. "Appurtenances" shall include all truck docks, canopies, exit porches, compactor pad and/or sidewalks adjacent to or within 5 feet of the building foundation. All requirements herein for building foundation subgrade preparation shall be constructed to a minimum distance of 5 feet beyond the outermost limits of said appurtenances.
- H. Unless specifically stated otherwise on the Drawings, the following table stipulates maximum allowable values (or range of values) for plasticity index (PI) and liquid limit (LL) of suitable materials to be used as fill in specified areas:

<u>Location</u>	<u>PI</u>	<u>LL</u>
Building and Pavement Areas	7 to 18	<35

3.9 ROCK FILL (Not Used)

3.10 PIPE BEDDING

- A. Excavate trenches for pipe or conduit to 4 inches below bottom of pipe and to the width as specified herein. Place 4 inches of bedding material, compact in bottom of trench, and shape to conform to lower portion of pipe barrel.
- B. Place bedding material in accordance with requirements of ASTM D 2321 unless otherwise shown on the drawings.
- C. Place geotextile fabric when specified on the Drawings and in accordance with Section 31-3200.

3.11 TRENCH BACKFILLING

- A. Materials used for trench backfill shall comply with requirements as specified herein.
- B. Backfill and compact in accordance with fill and compaction requirements of ASTM D 2321 unless otherwise shown on the drawings.
- C. Do not backfill trenches until required tests are performed and utility systems comply with and are accepted by applicable governing authorities.
- D. Backfill trenches to contours and elevations shown on the Drawings.
- E. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

3.12 BORINGS AND CASINGS UNDER ROADS, HIGHWAYS, AND RAILROAD CROSSINGS

- A. When indicated by the Drawings, street, road, highway, or railroad crossings for utility mains installed by jacking and boring method shall be in accordance with area specifications and governing authorities.

- B. Excavation of approach pits and trenches within right-of-way of street, road, highway, or railroad shall be of sufficient distance from paving or railroad tracks to permit traffic to pass without interference. Tamp backfill for approach pits and trenches within right-of-way in layers not greater than 6-inches thick for entire length and depth of trench or pit. Compact backfill to 98 percent of maximum density in accordance with ASTM D 698, (or 95 percent of maximum density, in accordance with ASTM D 1557) obtained at optimum moisture as determined by AASHTO T180. Mechanical tampers may be used after cover of 6 inches has been obtained over top of barrel of pipe.
- C. Accomplish boring operation using commercial type boring rig. Bore hole to proper alignment and grade. Bore hole shall be within 2 inches of same diameter as largest outside joint diameter of pipe installed. Install pipe in hole immediately after bore has been made and in no instance shall hole be left unattended while open.
- D. In event subsurface operations result in failure or damage to pavement or railroad tracks within 1 year of construction, make necessary repairs to pavement or railroad tracks. If paving cracks on either side of pipe line or is otherwise disturbed or broken due to construction operations, repair or replace disturbed or broken area.
- E. Clean, prime, and line interior and exterior of casing pipe with two coats of asphalt coating in accordance with area specifications and governing authorities.
- F. Butt weld steel casing. Welds shall be full penetration single butt-welds in accordance with AWWA C206.
- G. Install casing and utility pipe with end seals, vent pipe, and other special equipment in accordance with area specifications and governing authorities.

3.13 COMPACTION

- A. Compact as follows:

<u>Location</u>	<u>% of Max. Laboratory Density ASTM D 698</u>
Fill Below Structures (thickness < 4 feet)	95
Fill Below Structures (thickness > 4 feet)	98
Subgrade & Fill in Pavement Areas (Cohesive soils)	95
Subgrade & Fill in Pavement Areas (Non-Cohesive soils)	100
Utility Trench Backfill	95
Subgrade & Fill in All Other Areas	92

Note: If any portion of the fill beneath the structure exceeds four feet (4') then the entire select fill pad shall be compacted to the 98% density level.

- B. Maintain moisture content of not less than two percent (2%) below optimum and not more than two percent (2%) above optimum moisture content of fill materials to attain required compaction density.
- C. Exercise proper caution when compacting immediately over top of pipes or conduits. Water jetting or flooding is not permitted as method of compaction.
- D. Corrective Measures for Non-Complying Compaction: Remove and recompact deficient areas until proper compaction is obtained. Continual failure areas shall be stabilized in accordance with Section 31-3200 at no additional cost to Owner.

3.14 MAINTENANCE OF SUBGRADE

- A. Verify finished subgrades to ensure proper elevation and conditions for construction above subgrade. Field density test results shall become void if construction of foundations or placement of pavement section materials is not commenced within 48 hours after testing, or if subgrade is exposed to precipitation.
- B. Protect subgrade from excessive wheel loading during construction, including concrete trucks, dump trucks, and other construction equipment.
- C. Remove areas of finished subgrade found to have insufficient compaction density to depth necessary and replace in manner that will comply with compaction requirements by use of material with CBR equal to or better than that specified on the drawings. Surface of subgrade after compaction shall be firm, uniform, smooth, stable, and true to grade and cross-section.
- D. Construct temporary ditches and perform such grading as necessary to maintain positive drainage away from subgrade at all times.

3.15 BORROW AND SPOIL SITES

- A. Comply with TPDES and local erosion control permitting requirements for any and all on-site and off-site, disturbed spoil and borrow areas. Upon completion of spoil or borrow operations, clean up spoil or borrow areas in a neat and reasonable manner to the satisfaction of Owner or off-site property owner, if applicable.

3.16 FINISH GRADING

- A. Check grading of building subgrades by string line from grade stakes (blue tops) set at not more than 50-foot centers. Allowable tolerance shall be plus or minus 0.10 feet from plan grade. Provide engineering and field staking as necessary for verification of lines, grades, and elevations.
- B. Grade areas where finish grade elevations or contours are indicated on the Drawings, other than paved areas and buildings, including excavated areas, filled and transition areas, and landscaped areas. Graded areas shall be uniform and smooth, free from rock, debris, or irregular surface changes. Ground surfaces shall vary uniformly between indicated elevations. Grade finished ditches to allow for proper drainage without ponding and in manner that will minimize erosion potential. For topsoil, sodding, and seeding requirements refer to Landscape Planting specifications (by others).
- C. Correct settled and eroded areas within 1 year after date of completion at no additional expense to Owner. Bring grades to proper elevation.

3.17 FIELD TESTING

- A. Field density tests for in-place materials will be performed by the Independent Testing Laboratory (ITL) as follows:
 1. Building Subgrade Areas, Including 5'-0" Outside of Exterior Building Lines: In cut areas, not less than 1 compaction test for every 2,500 sq. ft. (minimum 4 tests per structure). In fill areas, same rate of testing for each 8-inch lift, with a minimum 4 tests per lift, measured loose.
 2. Pavement Subgrade Areas: In cut areas, not less than 1 compaction test for every 5,000 sq. ft. (minimum 4 tests per paving area). In fill areas, same rate of testing for each 8-inch lift, with a minimum 4 tests per lift per paving area, measured loose.
 3. Utility Trench Backfill: Intervals not exceeding 200-feet of trench for each 8-inch lift of compacted trench backfill (minimum 1 test each lift in each trench).
 4. Test Method: In-place nuclear density, ASTM D 6938 (Method B-Direct Transmission).

- B. Corrective Measures For Non-Complying Compaction: Remove and recompact deficient areas until proper compaction is obtained at no additional expense to Owner. Adjust moisture content as necessary to conform to the requirements of this section.
- C. Field testing, frequency, and methods may vary as determined by and between the Owner and the ITL.

END OF SECTION

SECTION 31-2500

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Installation of temporary and permanent erosion and sedimentation control systems.
 - 2. Installation of temporary and permanent slope protection systems.
- B. Related Sections
 - 1. Section 31-1000 – Site Clearing
 - 2. Section 31-2000 – Earthwork
 - 3. Section 31-3700 – Stone Protection (Rip Rap)
 - 4. Section 33-4000 – Storm Drainage
 - 5. Landscape Planting Specifications (by others)
 - 6. Storm Water Pollution Prevention Plan (SWPPP)
 - 7. Construction Drawings

1.2 ENVIRONMENTAL REQUIREMENTS

- A. Protect adjacent properties, any identified endangered or threatened species or critical habitat, any identified cultural or historic resources, and receiving water resources from erosion and sediment damage until final stabilization.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Quick growing grasses such as wheat, rye, or oats in accordance with Landscape Planting Specifications, when applicable, or as shown on the Construction Drawings.
- B. Silt Fencing and/or Straw Roll Wattles for sedimentation control as specified on the Construction Drawings.
- C. Turf Reinforcement Mats (TRMs), Erosion Control Blankets (ECBs), excelsior blankets and other revegetation mats as shown on the Construction Drawings.
- D. Temporary mulches such as loose straw, netting, wood cellulose, or agricultural silage.
- E. Rip-Rap as specified in Section 31-3700 or as shown on Construction Drawings.
- F. Temporary and permanent outfall structures as specified on the Construction Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Review the Construction Drawings and Storm Water Pollution Prevention Plan (SWPPP), if applicable.

- B. In the event that sitework on this project will disturb more than 5 acres, Contractor shall not begin construction without filing a Construction Notice Of Intent (NOI) to the Texas Commission on Environmental Quality (TCEQ) for a Texas Pollution Discharge Elimination System (TPDES) permit governing discharge of storm water from the site for entire construction period. If sitework will disturb less than 5 acres, but more than 1 acre, Contractor shall file a Construction Site Notice (CSN) with TCEQ. In each case, the TPDES permit requires SWPPP to be in place during construction with all notices and documentation kept on site. Refer to the TCEQ website (www.tceq.state.tx.us) for complete permitting details.
- C. Revise SWPPP if necessary to address potential pollution from site identified after issuance of the SWPPP, if applicable, at no additional cost to the owner.
- D. Conduct pre-construction stormwater meeting with Engineer upon request of Owner.

3.2 EROSION AND SEDIMENTATION CONTROL AND SLOPE PROTECTION IMPLEMENTATION

- A. Place erosion control systems in accordance with the Construction Drawings and SWPPP or as may be dictated by site conditions in order to maintain the intent of the specifications and permits.
- B. Deficiencies or changes on the Construction Drawings or SWPPP, if applicable shall be corrected or implemented as site conditions change. Changes during construction shall be noted in the SWPPP, if applicable, and marked on the Construction Drawings (SWPPP Site Map or Erosion Control Plan).
- C. Owner has authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations and to direct Contractor to provide immediate permanent or temporary pollution control measures.
- D. Maintain temporary erosion and sedimentation control systems as dictated by site conditions, indicated in the construction documents, or as directed by governing authorities or Owner to control sediment until final stabilization. Contractor shall respond to maintenance or additional work ordered by Owner or governing authorities immediately, but in no case, within not more than 7 days if required at no additional cost to the Owner.
- E. Contractor shall incorporate permanent erosion control features, paving, permanent slope stabilization, and vegetation into project at earliest practical time to minimize need for temporary controls.
- F. Permanently seed and mulch cut slopes as excavation proceeds to extent considered desirable and practical.
- G. Slopes that erode easily or that will not be graded for a period of 14 days or more shall be temporarily seeded as work progresses with wheat, rye, or oats application in accordance with Landscape Planting specifications, unless otherwise specified in the Contract Documents. In the event it is not practical to seed areas, slopes must be stabilized with geotextile fabric or other means to reduce the erosive potential of the area.

END OF SECTION

SECTION 31-3200

SOIL STABILIZATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Excavation, treatment, and backfilling of subgrade for lime, cement, fly ash, or bridge lift stabilization.
 - 2. Geotextile Fabric and/or Geogrid for stabilization of subgrade.
- B. Related Sections
 - 1. Section 31-2000 – Earthwork

1.2 REFERENCES

- A. American Society for Testing Materials (ASTM)
 - 1. ASTM C 150 – Portland Cement
 - 2. ASTM C 618 – Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete
 - 3. ASTM C 977 – Quicklime and Hydrated Lime for Soil Stabilization
 - 4. ASTM D 421 – Standard Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Soil Constants
 - 5. ASTM D 698 – Laboratory Compaction Characteristics of Soil Using Standard Effort
 - 6. ASTM D 1633 – Compressive Strength of Molded Soil-Cement Cylinders
- B. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. AASHTO M216 – Lime for Soil Stabilization
 - 2. AASHTO M288 – Geotextile Specification for Highway Applications
- C. National Lime Association (NLA)
 - 1. NLA Bulletin 326 – Lime Stabilization Construction Manual
- D. Texas Department of Transportation (TxDOT) – Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Latest Edition). References within these specifications (and/or on the Construction Drawings) to various item (or section) numbers from State DOT specifications are for purposes of additional information only; where conflicts may exist, the project specifications herein shall supersede the referenced State DOT specs. General requirements of the State DOT specifications as related to bid award, contract execution, scope of work, measurement and payment shall not be binding on this project unless otherwise specified in writing.

1.3 ENVIRONMENTAL REQUIREMENTS

- A. Do not install mixed materials in wind in excess of 10 mph or when temperature is below 40 degrees Fahrenheit.

1.4 SUBMITTALS

- A. Submit 30-pound sample of each material to be used at the site in airtight containers to the Independent Testing Laboratory or submit gradation and certification of material that is to be used to the Independent Testing Laboratory for review.
- B. Submit name of each materials supplier and specific type and source of each material. Obtain approval of Owner prior to change in source.

- C. Submit mix design and materials mix ratio to Independent Testing Laboratory that will achieve specified requirements as indicated in the documents (or as specified by state and local agencies for soil stabilization if not stated in documents).
- D. If geogrids or geotextiles are to be used, design shall be submitted to Owner for approval.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with state and local standards in conjunction with requirements specified herein.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Soil Treatment Materials:
 - 1. Hydrated Lime: ASTM C 977 or AASHTO M216
 - 2. Portland Cement: ASTM C 150, Type I
 - 3. Fly Ash: ASTM C 618
- B. Aggregate
 - 1. Coarse Aggregate: Crushed carbonate, crushed gravel, crushed air-cooled slag, granulated slag, a mixture of crushed and granulated slag, or other types of suitable material meeting the following gradation requirements:

Sieve Size	Percent Passing
2 inches	100
1 inch	70-100
3/4 inch	50-90
No. 4	30-60
No. 30	7-30
No. 200	0-5

- 2. Fine Aggregate: Sand – Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter meeting the following gradation requirements:

Sieve Size	Percent Passing
No. 4	90-100
No. 50	7-40
No. 200	0-5

- C. Subsoil: Existing to be reused.
- D. Bridge Lift Material: Surge stone, granular fill, or shot rock fill.

2.2 ACCESSORIES

- A. Curing Seal: Asphalt Emulsion Primer
- B. Geotextile Fabric for Stabilization: Provide one of the following:
 - 1. Mirafi 500X or 600X, TenCate Geosynthetics
 - 2. Basetex, Tensar, Inc.
 - 3. Propex 250ST (woven) or Geotex 801 (non-woven), Hancor/Propex
- C. Geogrid for Stabilization: Provide one of the following
 - 1. Tensar BX 1100
 - 2. Tensar BX 1200

2.3 EQUIPMENT

- A. Perform operations using suitable, well maintained equipment capable of excavating subsoil, mixing and placing materials, wetting, consolidating, and compacting of material.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Obtain approval from the Independent Testing Laboratory of mix design before proceeding with placement.
- B. Start stabilization only when weather and soil conditions are favorable for successful application of proposed material.
- C. Proofroll subgrade, to identify areas in need of stabilization, in accordance with Section 31-2000.

3.2 EXCAVATION

- A. Excavate subsoil to depth sufficient to accommodate soil stabilization.
- B. Remove lumped subsoil, boulders, and rock that interfere with achieving uniform subsoil conditions.
- C. Do not excavate within normal 45 degree bearing splay of any foundation.
- D. Notify Owner's representative of unexpected subsurface conditions. Discontinue affected work in area until notified to resume work.
- E. Correct areas over-excavated in accordance with Section 31-2000.
- F. Remove excess excavated material from site.

3.3 GEOTEXTILE FABRIC AND/OR GEOGRID

- A. Place geotextile fabric and/or geogrid over subsoil surface, lap edges and ends in accordance with manufacturer's recommendations in those areas that are shown on Construction Drawings or in those areas that need additional stabilization prior to placement of base course. Bridge lift sections may require the use of geotextile fabric and/or geogrid for stabilization prior to placement of fill.
- B. Place geotextile fabric and/or geogrid in accordance with manufacturer's recommendations.

3.4 SOIL TREATMENT AND BACKFILLING

- A. Lime Stabilized Subgrade: Where indicated on Construction Drawings or as required after continual failure, treat prepared clayey subgrades (those with PI greater than 20) with hydrated lime in accordance with TxDOT specifications, Item 260. In addition to gradation requirements therein, the lime-stabilized clay shall have minimum 85 percent, on a dry weight basis, of the material passing a 3/4-inch sieve, with moisture content at or above optimum. The lime-stabilized clay shall have a plasticity index of 15 or less based on dry sample method per ASTM D 421. A minimum five percent (5%) of lime by dry weight of soil shall be used for lean clays and minimum eight percent (8%) of lime by dry weight for fat clays. Lime-stabilized clay fill shall be placed in maximum 8-inch lifts compacted to minimum 95 percent of maximum dry density per ASTM D 698, at moisture content not less than optimum nor greater than 4 percent above optimum. If sulfate-reactive soils are encountered during excavation, the risk of adverse reactions with lime may render the use of lime infeasible for this project.

- B. Cement Stabilized Subgrade: Where indicated on Construction Drawings or as required after continual failure, treat prepared subgrade with Portland cement in accordance with TxDOT specifications, Item 275. A minimum of six percent (6%) cement, by dry weight of soil, shall be used for silty sands, clayey sands and silty-clayey sands. Compact the cement-stabilized subgrade to minimum 95 percent of the maximum dry unit weight per ASTM D 698 at a moisture content within 2 percent of optimum.
- C. Lime-Fly Ash Stabilized Subgrade: Where indicated on Construction Drawings or as required after continual failure, treat prepared subgrade with lime-fly ash in accordance with TxDOT specifications, Item 265. A minimum of two percent (2%) lime and eight percent (8%) fly ash, by dry weight of soil, shall be used for lean clays, sandy clays, clayey sands, silty-clayey sands and silty sands. A commercial lime-fly ash blend with a 70-30 mixture (lime to fly ash) shall be used for lean clays, sandy clays, clayey sands, silty-clayey sands and silty sands.
- D. Bridge Lifts: Where indicated on Construction Drawings or as required after continual failure, treat prepared subgrade by application of a bridge lift. Bridging over existing soils shall be acceptable only when approved in writing by the Owner. Place geotextile fabric or geogrid over existing soils to be bridged. The geotextile fabric or geogrid selected shall be appropriate for the bridge lift material being placed. Place bridge lift over geotextile fabric or geogrid. Surge stone and shot rock will be approved by the Owner's representative on a submittal basis. The Owner and the Owner's representative shall have sole discretion as to the acceptability of all submittals.
- E. Backfill and compaction of treated subsoil shall be in accordance with Sections 31-2000.
- F. Maintain optimum moisture of mixed materials to attain required stabilization and compaction.
- G. Finish subgrade surface in accordance with Section 31-2000.
- H. Remove surplus mix materials from site.

3.5 CURING

- A. Immediately following compaction of mix, seal top surface with curing seal.
- B. Do not permit traffic for 72 hours after sealing top surface.

3.6 FIELD QUALITY CONTROL

- A. Unconfined compression tests on lime, fly ash, or cement treated mixture shall be conducted in accordance with ASTM D 1633. Three tests shall be conducted for each mix design tested. Samples shall be cured at a constant moisture content and temperature for 28 days. Scratch portion of the test shall be omitted.
- B. Field Density: Field in-place density shall be determined as specified in Section 31-2000. At least one field density test shall be performed for each 1000 square feet (or fraction thereof) of each layer of stabilized subgrade or subbase material.
- C. If tests indicate work does not meet specified requirements, remove work, replace and retest.

END OF SECTION

SECTION 32-1313

PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Preparation and placement of Portland cement concrete parking areas.
 - 2. Preparation and placement of Portland cement concrete streets, drives and entrances.
- B. Related Sections
 - 1. Section 31-2000 – Earthwork
 - 2. Section 32-1723 – Pavement Markings

1.2 REFERENCES

- A. American Concrete Institute (ACI)
 - 1. ACI 301 – Structural Concrete for Buildings.
 - 2. ACI 305R – Hot Weather Concreting
 - 3. ACI 306R – Standard Specification for Cold Weather Concreting
 - 4. ACI 308 – Standard Practice for Curing Concrete
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM A 615 – Deformed and Plain Billet-Steel for Concrete Reinforcement
 - 2. ASTM C 31 – Making and Curing Concrete Test Specimens in the Field
 - 3. ASTM C 33 – Concrete Aggregates
 - 4. ASTM C 39 – Comprehensive Strength of Cylindrical Concrete Specimens
 - 5. ASTM C 42 – Obtaining And Testing Drilled Cores And Sawed Beams Of Concrete
 - 6. ASTM C 94 – Ready-Mixed Concrete
 - 7. ASTM C 138 – Unit Weight, Yield, and Air Content (Gravimetric) of Concrete
 - 8. ASTM C 143 – Slump of Hydraulic Cement Concrete
 - 9. ASTM C 150 – Portland Cement
 - 10. ASTM C 172 – Sampling Freshly Mixed Concrete
 - 11. ASTM C 231 – Air-Content of Freshly Mixed Concrete by the Pressure Method
 - 12. ASTM C 260 – Air-Entraining Admixtures for Concrete
 - 13. ASTM C 309 – Liquid Membrane-Forming Compounds for Curing Concrete
 - 14. ASTM C 920 – Elastomeric Joint Sealants
 - 15. ASTM C 1064 – Temperature Of Freshly Mixed Portland Cement Concrete
 - 16. ASTM D 994 – Preformed Expansion Joint Filler for Concrete (Bituminous Type)
 - 17. ASTM D 1751 – Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
 - 18. ASTM D 2628 – Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
- C. Federal Specifications (FS)
 - 1. FS HH-F-341 – Fillers, Expansion Joint: Bituminous (Asphalt & Tar)
- D. Texas Department of Transportation (TxDOT) – Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Latest Edition). References within these specifications (and/or on the Construction Drawings) to various item (or section) numbers from State DOT specifications are for purposes of additional information only; where conflicts may exist, the project specifications herein shall supersede the referenced State DOT specs. General requirements of the State DOT specifications as related to bid award, contract execution, scope of work, measurement and payment shall not be binding on this project unless otherwise specified in writing.

1.3 QUALITY ASSURANCE

- A. Establish and maintain required lines and elevations.
- B. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable paving as directed by Owner.

1.4 SUBMITTALS

- A. Submit certified laboratory test data or manufacturer's certificates and data for the items listed below certifying that materials are in conformance requirements specified herein. Submit to the Engineer and to the Independent Testing Laboratory for review and approval and within 7 calendar days after receipt of Notice-to-Proceed.
 - 1. Portland cement concrete mix
 - 2. Aggregate gradations
 - 3. Preformed expansion joint filler
 - 4. Field molded/poured sealant
 - 5. Dowel bars
 - 6. Expansion sleeves
 - 7. Tie bars
 - 8. Reinforcing steel bars
 - 9. Air entraining admixtures
 - 10. Water-reducing and set-retarding admixtures (if used)
- B. Submit certification that joint sealant has been installed in accordance with the manufacturer's instructions. Include copy of written instructions.

1.5 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete: Mix concrete and deliver in accordance with ASTM C 94.
 - 1. Design mix shall produce normal weight concrete consisting of Portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce following:
 - a. Compressive Strength: 3,600 psi, minimum at 28 days, as shown on Construction Drawings
 - b. Slump Range: 2"-4" for hand placed concrete, 1-1/4" to 3" for machine placed (slipform) concrete
 - c. Air Entrainment: 3 to 6 percent
- B. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Coat forms with non-staining type of coating that will not discolor or deface surface of concrete.
- C. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60.
- D. Portland Cement: ASTM C 150, Type I or II
- E. Joint Fillers: Resilient pre-molded bituminous impregnated fiberboard units complying with ASTM D 994, D 1751, D 2628; FS HH-F-341, Type II, Class A.

- F. Joint Sealants: ASTM C 920, Type S or Type M, Use T; non-priming, pourable, self-leveling polyurethane. Acceptable sealants include:
 - 1. Sonneborn: Sonomeric 1, Sonolastic SL1 or Sonolastic SL2
 - 2. Tremco Commercial Sealants: Vulkem 45
 - 3. Sika Corporation: Sikaflex-1C or Sikaflex-2c
 - 4. Euclid Chemical Corporation: Eucolastic I or II
 - 5. W.R. Meadows, Inc.: Gardox
- G. Aggregate: ASTM C 33.
- H. Water: Clean and potable
- I. Dowel Bars: ASTM A 615, grade 60, and plain steel bars.
- J. Air Entraining Mixture: ASTM C 260. Acceptable products include:
 - 1. Sika Corporation: Sika AEA-14, Sika AEA-15, Sika AER or Sika AIR
 - 2. Euclid Chemical Corporation: Air Mix or AEA
 - 3. Construction Chemicals: ACOM-U8
 - 4. BASF Chemical Co.: MB-AE 90
- K. Curing Compound: ASTM C 309, Type 1. Acceptable products include:
 - 1. Sonneborn: Kure-N-Seal
 - 2. ChemMasters Corporation: Polyseal Plus
 - 3. Euclid Chemical Corporation: Aqua-Cure VOX or Super Aqua-Cure VOX
 - 4. Construction Chemicals: ACC-L7
- L. Joint Backup Rods: Acceptable products include:
 - 1. Chase Construction Products: CEVA Rod 100
 - 2. W.R. Meadows, Inc.: SealTight Cera-Rod
 - 3. Nomaco, Inc.: HBR XL Backer Rod

PART 3 - EXECUTION

3.1 PREPARATION

- A. Proofroll prepared base material surface to check for unstable areas in accordance with Section 31-2000 including documentation and re-proof rolling as required. Paving work shall begin only after unsuitable areas have been corrected and are ready to receive paving.
- B. Remove loose material from compacted base material surface to produce firm, smooth surface immediately before placing concrete.

3.2 INSTALLATION

- A. Form Construction
 - 1. Set forms to required grades and lines, rigidly braced and secured.
 - 2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place minimum of 24 hours after concrete placement.
 - 3. Check completed formwork for grade and alignment to following tolerances:
 - a. Top of forms not more than 1/8-inch in 10'-0".
 - b. Vertical face on longitudinal axis, not more than 1/4-inch in 10'-0".
 - 4. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.
- B. Reinforcement: Fasten reinforcing (as specified on Construction Drawings) accurately and securely in place with suitable supports and ties. Supports provide for minimum 2 inches clearance between reinforcement and subgrade (or subbase) material. Remove from reinforcement

all dirt, oil, loose mill scale, rust, and other substances that will prevent proper bonding of the concrete to the reinforcement.

C. Concrete Placement

1. Concrete may be mixed and placed when the air temperature in the shade and away from artificial heat is a minimum of 35 degrees F and rising. Hot and cold weather concreting shall be in accordance with ACI 305R and 306R, respectively.
2. Do not place concrete until base material and forms have been checked for line and grade. Moisten base material if required to provide uniform dampened condition at time concrete is placed. Concrete shall not be placed around manholes or other structures until they are at required finish elevation and alignment.
3. Place concrete using methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
4. Deposit and spread concrete in continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place construction joint.

D. Joint Construction: Construct expansion, weakened-plane control (contraction), and construction joints straight with face perpendicular to concrete surface. Construct transverse joints perpendicular to centerline, unless otherwise detailed.

1. Weakened-Plane Control or Contraction Joints: Provide joints at spacing of 30 x pavement thickness on center (e.g., 12.5 feet centers for 5-in. paving, 15.0 feet centers for 6-in. paving, 17.5 feet centers for 7-in. paving), maximum, each way. Construct control joints for depth equal to at least 1/3 of the concrete thickness, as follows:
 - a. Form tooled joints in fresh concrete by grooving top with recommended tool and finishing edge with jointer.
 - b. Form sawed joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will support cutting equipment (not less than 4 hours nor more than 18 hours after placement).
2. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for period of more than 1/2 hour, except where such placements terminate at expansion joints. Construct joints in accordance with standard details.
3. Transverse Expansion Joints: Locate expansion joints at maximum of 90'-0" spacing each way unless otherwise shown on the Construction Drawings. Provide pre-molded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, sidewalks, and other fixed objects.
4. Butt Joints: For joints against existing pavement, place 16" long dowels eight inches into holes drilled into center of existing slab. Epoxy dowels into holes with approved epoxy compound. Place dowels prior to concrete placement for new concrete. Dowel spacing to be 24" on center unless otherwise shown on Construction Drawings. Saw joint and fill with joint sealer.

E. Joint Fillers: Extend joint fillers full-width and depth of joint, and not less than 1/2-inch or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint fillers in 1-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip joint filler sections together.

F. Joint Sealants: Joints shall be sealed with approved exterior pavement joint sealants and shall be installed in accordance with manufacturer's recommendations. Contractor shall verify with manufacturer all recommendations including, but not limited to, product use with specific pavement temperature, time of day for sealant installation (based on time of year, temperature and location), pavement cure time prior to installation, and cure time prior to allowing traffic.

3.3 CONCRETE FINISHING

- A. After striking off and consolidating concrete, smooth surface by screeding and floating. Adjust floating to compact surface and produce uniform texture. After floating, test surface for trueness with 10'-0" straightedge. Distribute concrete as required to remove surface irregularities and re-float repaired areas to provide continuous smooth finish.
- B. Work edges of slabs and formed joints with edging tool, rounding edge to 1/2-inch radius. Eliminate tool marks on concrete surface. After completion of floating and troweling, when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 - 1. Inclined Slab Surfaces: Provide coarse, non-slip finish by scoring surface with stiff-bristled broom perpendicular to flow of traffic so as to produce regular corrugations not over 1/16 of an inch deep.
 - 2. Paving: Provide coarse, non-slip finish by scoring surface with stiff-bristled broom perpendicular to flow of traffic so as to produce regular corrugations not over 1/16 of an inch deep.
- C. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point up minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Owner.
- D. Protect and cure finished concrete paving using either membrane curing compound or moist-curing methods described in "water-curing" section of ACI 308.

3.4 CLEANING AND ADJUSTING

- A. The Contractor shall certify in writing that placement is in accordance with specification requirements.
- B. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.
- C. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials.

3.5 FIELD QUALITY CONTROL

- A. Field quality control tests specified herein will be conducted by the Independent Testing Laboratory. The Contractor shall perform additional testing as considered necessary by the Contractor for assurance of quality control. Retesting required as a result of failed initial tests shall be at the Contractor's expense.
- B. Field testing, frequency, and methods may vary as determined by and between the Owner and the Testing Laboratory.
- C. Review the Contractor's proposed materials and mix design for conformance with specifications.
- D. Perform testing in accordance with ACI 301 and testing standards listed herein.
- E. Strength Tests:
 - 1. Secure composite samples in accordance with ASTM C 172. Sample at regularly spaced intervals from middle portion of the batch. Sampling time shall not exceed 15 minutes.
 - 2. Mold and cure specimens in accordance with ASTM C 31.
 - a. A minimum of four concrete test cylinders shall be taken for every 100 cubic yards or less of each class of concrete placed each day and not less than once for each 5000 square feet of paved area.

- b. During the initial 24 hours (plus or minus 8 hours) after molding, the temperature immediately adjacent to the specimens shall be maintained in the range of 60 to 80 degrees F. Control loss of moisture from the specimens by shielding from the direct rays of the sun and from radiant heating devices.
 - c. Specimens transported prior to 48 hours after molding shall not be demolded, but shall continue initial curing at 60 to 80 degrees F until time for transporting.
 - d. Specimens transported after 48 hours age shall be demolded in 24 hours (plus or minus 8 hours). Curing shall then be continued but in saturated limewater at 73.4 degrees (plus or minus 3 degrees F) until the time of transporting.
 - e. Wet cure cylinders under controlled temperature until testing.
3. Test cylinders in accordance with ASTM C 39.
- a. Date test cylinders and number consecutively. Give each cylinder of each set an identifying letter (i.e. A, B, C, D). Prepare a sketch of the building plan for each test set identifying location of placed concrete.
 - b. Test one cylinder (A) at 7 days for information. If the compressive strength of the concrete sample is equal to or above the 28 day specified strength, test another cylinder (B) at 7 days. The average of the breaks shall constitute the compressive strength of the concrete sample.
 - c. Test two cylinders (B and C) at 28 days and the average of the breaks shall constitute the compressive strength of the concrete sample.
 - d. Retain fourth cylinder (D) for further testing if needed, but do not retain cylinder more than 60 days.
4. Evaluation and Acceptance:
- a. Strength level of concrete will be considered satisfactory if the average of all sets of three consecutive strength tests equal or exceed specified strength and no individual strength test (average of two cylinders) results are below specified compressive strength by more than 500 psi.
 - b. Complete concrete work will not be accepted unless requirements of ACI 301, have been met, including dimensional tolerances, appearance, and strength of structure.
 - c. Where average strength of cylinders, as shown by tests is not satisfactory, Owner reserves the right to require Contractor to provide improved curing conditions of temperature and moisture to secure required strength. If average strength of laboratory control cylinders should fall so low as to cause portions of structure to be in question, follow core procedure set forth in ASTM C 42. If results of core test indicate that strength of structure is inadequate, provide without additional cost to Owner, replacement, load testing, or strengthening as may be ordered by Owner. If core tests are so ordered and results of such tests disclose that strength of structure is as required, cost of test will be paid by Owner.
- F. Slump Test: Conduct slump test for each cylinder set taken in accordance with ASTM C 143. Make additional slump tests for every other load from a stationary mixer or truck to test consistency. Sampling shall be in accordance with ASTM C 172.
- G. Air Content: Conduct air content test for each cylinder set for concrete exposed to freeze-thaw in accordance with ASTM C 231, ASTM C 173, or ASTM C 138. Indicate test method on report. Make test at same time as slump test.
- H. Unit Weight: ASTM C 138.
- I. Temperature Test: Conduct temperature test for each cylinder set taken in accordance with ASTM C 1064. Test hourly when air temperature is 40 F and below or 80 F and above. Determine temperature of concrete sample and ambient air for each strength test.
- J. In addition to required information noted previously in this Section, record the following information on concrete compression reports:
- 1. Test cylinder number and letter.
 - 2. Specific foundations or structures covered by this test.

3. Proportions of concrete mix or mix identification.
 4. Maximum size coarse aggregate.
 5. Specified compressive strength.
 6. Tested compressive strength.
 7. Slump, air-content (when applicable) and concrete temperature.
 8. Concrete plastic unit weight.
 9. Concrete Temperature.
 10. Elapsed time from batching at plant to discharge from delivery truck at project.
 11. Date and time concrete was placed.
 12. Ambient temperature, wind speed, and relative humidity during concrete placement.
 13. Name of technician securing samples.
 14. Curing conditions for concrete strength test specimens (field and laboratory).
 15. Date strength specimens transported to laboratory.
 16. Age of strength specimens when tested.
 17. Type of fracture during test.
- K. At the start of each day's mixing, report any significant deviations from approved mix design including temperature, moisture and condition of aggregate.
- L. Certify each delivery ticket of concrete. Report type of concrete delivered, amount of water added and time at which cement and aggregate were loaded into truck, and time at which concrete was discharged from truck
- M. In Place Pavement Testing: The Independent Testing Laboratory will randomly core pavement at minimum rate of 1 core per 20,000 sq. ft of pavement, with minimum of 3 cores from heavy-duty areas and 3 cores from light duty areas. Cores will be sampled and tested in accordance with ASTM C 42. Core will be tested for thickness and quality of aggregate distribution. Core holes shall be patched by the Contractor immediately with Portland cement concrete and shall be finished to provide level surface as specified herein.
- N. Additional Tests: Additional in-place tests shall be conducted as directed by the Owner's representative when specified concrete strengths and other characteristics have not been attained in the structures.

END OF SECTION

SECTION 32-1613

CURBS AND SIDEWALKS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Portland cement concrete curb, gutter, and sidewalk.
- B. Related Sections
 - 1. Section 31-2000 – Earthwork

1.2 REFERENCES

- A. American Concrete Institute (ACI)
 - 1. ACI 305R – Hot Weather Concreting
 - 2. ACI 306R – Standard Specification for Cold Weather Concreting
 - 3. ACI 308 – Standard Practice for Curing Concrete
- B. American Standards for Testing and Materials (ASTM) latest edition
 - 1. ASTM A 615 – Deformed and Plain Billet-Steel for Concrete Reinforcement
 - 2. ASTM C 94 – Ready-Mixed Concrete
 - 3. ASTM C 260 – Air-Entraining Admixtures for Concrete
 - 4. ASTM C 309 – Liquid Membrane-Forming Compounds for Curing Concrete
 - 5. ASTM C 920 – Elastomeric Joint Sealants
 - 6. ASTM D 994 – Preformed Expansion Joint Filler for Concrete (Bituminous)
 - 7. ASTM D 1190 – Concrete Joint Sealer, Hot Poured, Elastic Type
 - 8. ASTM D 1751 – Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
 - 9. ASTM D 2628 - Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
- C. Federal Specifications (FS)
 - 1. FS HH-F-341 – Fillers, Expansion Joint: Bituminous (Asphalt & Tar)
- D. Texas Department of Transportation (TxDOT) – Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Latest Edition). References within these specifications (and/or on the Construction Drawings) to various item (or section) numbers from State DOT specifications are for purposes of additional information only; where conflicts may exist, the project specifications herein shall supersede the referenced State DOT specs. General requirements of the State DOT specifications as related to bid award, contract execution, scope of work, measurement and payment shall not be binding on this project unless otherwise specified in writing.

1.3 SUBMITTALS

- A. Submit materials certificate from materials producer and Contractor, certifying that materials comply with, or exceed requirements specified herein to the Engineer and to the Independent Testing Laboratory for review and approval and within 7 calendar days after receipt of Notice-to-Proceed, submit for approval, certified laboratory test data or manufacturers certificates and data for the following items:
 - 1. Portland cement concrete mix
 - 2. Aggregate gradations
 - 3. Preformed expansion joint filler
 - 4. Field molded/poured sealant

5. Dowel bars
6. Expansion sleeves
7. Tie bars
8. Reinforcing steel bars
9. Air entraining admixtures
10. Water-reducing and set-retarding admixtures (if used)

1.4 QUALITY ASSURANCE

- A. Establish and maintain required lines and elevations.
- B. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable work as directed by Owner.

1.5 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete: Mix concrete and deliver in accordance with ASTM C 94.
 1. Design mix shall produce normal weight concrete consisting of Portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce following:
 - a. Compressive Strength: 3,600 psi, minimum at 28 days, unless otherwise indicated on Construction Drawings.
 - b. Slump Range: 2"-4" for hand placed concrete, 1-1/4" to 3" for machine placed (slipform) concrete
 - c. Air Entrainment: 3 to 6 percent
- B. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Forms shall be of depth equal to depth of curbing or sidewalk, and so designed as to permit secure fastening together at tops. Coat forms with non-staining type of coating that will not discolor or deface surface of concrete.
- C. Reinforcing Steel: Deformed steel bars, ASTM A 615, Grade 60.
- D. Portland Cement: Shall conform to ASTM C 150, Type I or II
- E. Joint Fillers: Resilient pre-molded bituminous impregnated fiberboard units complying with ASTM D 994, D 1751, D 2628; FS HH-F-341, Type II, Class A or approved equal.
- F. Joint Sealants (Hot-Poured): Conforming to ASTM D 1190, non-priming, self-leveling polyurethane. Acceptable sealants include:
 1. W.R. Meadows, Inc.: SealTight #164 or SealTight #1190
 2. Construction Chemicals: HJS-T6
- G. Joint Sealants (Cold-Poured): Conforming to ASTM C 920, Type S or Type M, Use T; non-priming, pourable, self-leveling polyurethane. Acceptable sealants include :
 1. Sonneborn: Sonolastic SL1 or Sonolastic SL2
 2. Tremco Commercial Sealants: Vulkem 45
 3. Sika Corporation: Sikaflex-1C or Sikaflex-2c
 4. Euclid Chemical Corporation: Eucolastic I or II
 5. W.R. Meadows, Inc.: Gardox

- H. Aggregate: ASTM C 33.
- I. Water: Clean and potable
- J. Dowel Bars: ASTM A 615, grade 60, and plain steel bars.
- K. Air Entraining Mixture: ASTM C 260. Acceptable products include:
 - 1. Sika Corporation: Sika AEA-14, Sika AEA-15, Sika AER or Sika AIR
 - 2. Euclid Chemical Corporation: Air Mix or AEA
 - 3. Construction Chemicals: ACOM-U8
- L. Curing Compound: ASTM C 309, Type 1. Acceptable products include:
 - 1. Sonneborn: Kure-N-Seal
 - 2. ChemMasters Corporation: Polyseal Plus
 - 3. Euclid Chemical Corporation: Aqua-Cure VOX or Super Aqua-Cure VOX
 - 4. Construction Chemicals: ACC-L7
- M. Joint Backup Rods: Acceptable products include:
 - 1. Chase Construction Products: CEVA Rod 100
 - 2. W.R. Meadows, Inc.: SealTight Cera-Rod
 - 3. Nomaco, Inc.: HBR XL Backer Rod

PART 3 - EXECUTION

3.1 PREPARATION

- A. Begin paving work only after unsuitable areas have been corrected and are ready to receive paving. The subgrade beneath all sidewalks shall be scarified, moisture-conditioned and re-compacted to at least 95 percent of the Standard Proctor maximum dry density.
- B. Remove loose material from compacted base material surface to produce firm, smooth surface immediately before placing concrete.

3.2 INSTALLATION

- A. Form Construction
 - 1. Set forms to required grades and lines, rigidly braced and secured.
 - 2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place minimum of 24 hours after concrete placement.
 - 3. Check completed formwork for grade and alignment to following tolerances:
 - a. Top of forms not more than 1/8-inch in 10'-0".
 - b. Vertical face on longitudinal axis, not more than 1/4-inch in 10'-0".
 - 4. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.
- B. Reinforcement: Fasten reinforcing bars or welded wire fabric (if required) accurately and securely in place with suitable supports and ties. Remove from reinforcement all dirt, oil, loose mill scale, rust, and other substances that will prevent proper bonding of the concrete to the reinforcement.
- C. Concrete Placement
 - 1. Concrete shall be mixed and placed when the air temperature in the shade and away from artificial heat is a minimum of 35 degrees F and rising. Hot and cold weather concreting shall be in accordance with ACI 305R and 306R, respectively.
 - 2. Do not place concrete until base material and forms have been checked for line and grade. Moisten base material if required to provide uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until set at required finish elevation and alignment.

3. Place concrete using methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
4. Deposit and spread concrete in continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place construction joint. Automatic machine may be used for curb and gutter placement. Machine placement shall be at required cross section, line, grade, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified herein.

D. Joint Construction

1. Contraction Joints: Construct concrete curb or combination concrete curb and gutter, where specified on Construction Drawings, in uniform sections of length specified on Construction Drawings. Form joints between sections either by steel templates, 1/8-inch in thickness, of length equal to width of curb and gutter, and with depth which will penetrate at least 2-inches below surface of curb and gutter; or with 3/4-inch thick performed expansion joint filler cut to exact cross section of curb and gutter; or by sawing to depth of at least 2-inches while concrete is between 4 and 24 hours old. If steel templates are used, they shall be left in place until concrete has set enough to hold its shape, but shall be removed while forms are still in place.
2. Longitudinal Construction Joints: Tie concrete curb or combination concrete curb and gutter, where specified on Construction Drawings, to concrete pavement with 1/2-inch round deformed reinforcement bars of length and spacing shown on Construction Drawings.
3. Transverse Expansion Joints: Concrete curb, combination concrete curb and gutter, or concrete sidewalk shall have filler cut to exact cross section of curb, gutter, or sidewalk. Joints shall be similar to type of expansion joint used in adjacent pavement.

E. Joint Fillers: Extend joint fillers full-width and depth of joint, and not less than 1/2-inch or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint fillers in 1-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip joint filler sections together.

F. Joint Sealants: Install in accordance with manufacturer's recommendations.

3.3 CONCRETE FINISHING

- A. After striking off and consolidating concrete, smooth surface by screeding and floating. Adjust floating to compact surface and produce uniform texture. After floating, test surface for trueness with 10'-0" straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide continuous smooth finish.
- B. Work edges of sidewalks, gutters, back top edge of curb, and formed joints with edging tool, rounding edge to 1/2-inch radius. Eliminate tool marks on concrete surface. After completion of floating and trowelling, when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 1. Curbs, gutters, and sidewalks: Broom finish by drawing fine-hair broom across surface perpendicular to flow of traffic. Repeat operation as necessary to produce fine line texture.
- C. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point up minor honeycombed areas. Remove and replace areas or sections with major defects as directed Owner.
- D. Protect and cure finished concrete paving using acceptable moist-curing methods in accordance with "water-curing" section of ACI 308.

3.4 BACKFILL

- A. After concrete has set sufficiently, spaces on either side of concrete curb, combination concrete curb and gutter, or concrete sidewalk shall be refilled to required elevation with suitable material compacted in accordance with Section 31-2000.

3.5 CLEANING AND PROTECTION

- A. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.
- B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials.

END OF SECTION

SECTION 32-1723

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Painting and marking of pavements, curbs, guard posts, and light pole bases.

1.2 REFERENCES

- A. American Association of State Highway and Transportation (AASHTO)
 - 1. AASHTO M248 - Ready-Mixed White and Yellow Traffic Paints
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM D 4414 - Standard Practice for Measurement of Wet Film Thickness by Notched Gauges.
- C. Federal Specifications (FS)
 - 1. FS A-A-2886 - Paint, Traffic, Solvent Based (supersedes FS TT-P-85 and FS TT-P-115, Type I)
 - 2. FS TT-P-1952 - Paint, Traffic And Airfield Marking, Waterborne
- D. Texas Department of Transportation (TxDOT) – Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Latest Edition). References within these specifications (and/or on the Construction Drawings) to various item (or section) numbers from State DOT specifications are for purposes of additional information only; where conflicts may exist, the project specifications herein shall supersede the referenced State DOT specs. General requirements of the State DOT specifications as related to bid award, contract execution, scope of work, measurement and payment shall not be binding on this project unless otherwise specified in writing.

1.3 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize flagmen, barricades, warning signs, and warning lights as required.

1.4 QUALITY ASSURANCE

- A. Use trained and experienced personnel in applying the products and operating the equipment required for properly performed work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Paint shall be waterborne or solvent borne, colors as shown on Construction Drawings or as specified herein. Pavement marking paints shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials shall conform to the restrictions of the local Air Pollution Control District.
- B. Waterborne Paint: Paints shall conform to FS TT-P-1952.

- C. Solvent Borne Paint: Paint shall conform to FS A-A-2883 or AASHTO M248. Paint shall be non-bleeding, quick-drying, and alkyd petroleum base paint suitable for traffic-bearing surface and be mixed in accordance with manufacture's instructions before application for colors White, Yellow, Blue, and Red.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the work area and correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Sweep and clean surface to eliminate loose material and dust.
- B. Where existing pavement markings are indicated on Construction Drawings to be removed or would interfere with adhesion of new paint, a motorized abrasive device shall be used to remove the markings. Equipment employed shall not damage existing paving or create surfaces hazardous to vehicle or pedestrian traffic. Within public rights-of-way, appropriate governing authority shall approve method of marking removal.
- C. New pavement surfaces shall be allowed to cure for not less than 30 days before application of marking materials.

3.3 CLEANING EXISTING PAVEMENT MARKINGS

- A. In general, markings shall not be placed over existing pavement marking patterns. Existing pavement markings, which are in good condition but interfere or conflict with the newly applied marking patterns, shall be removed. Deteriorated or obscured markings that are not misleading or confusing or do not interfere with the adhesion of the new marking material do not require removal. Whenever grinding, scraping, sandblasting or other operations are performed, the work shall be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that is misleading or confusing. When these operations are completed the pavement surface shall be blown off with compressed air to remove residue and debris resulting from the cleaning work.

3.4 APPLICATION

- A. Apply two coats of paint at manufacturer's recommended rate, without addition of thinner, with maximum of 100 square feet per gallon or as required to provide a minimum wet film thickness of 15 mils and dry film thickness of 7 ½ mils per coat. Paint shall be applied for a total dry film thickness of 15 mils. Apply with mechanical equipment to produce uniform straight edges. At sidewalk curbs and crosswalks, use straightedge to ensure uniform, clean, and straight stripe.
- B. Install pavement markings according to manufacturer's recommended procedures for the specified material.
- C. Following items shall be painted with colors noted below:
 - 1. Pedestrian Crosswalks: White
 - 2. Light Pole Bases and Guard posts: Yellow
 - 3. Fire Lanes: Red or per local code
 - 4. Lane Striping where separating traffic moving in opposite directions: Yellow
 - 5. Lane Striping where separating traffic moving in the same direction: White
 - 6. ADA Symbols: White on Blue background, or per local code
 - 7. Parking Stall Striping: White, unless otherwise noted on Construction Drawings

3.5 FIELD QUALITY CONTROL

- A. Inspection: After the paint has thoroughly dried, visually inspect the entire application and touch up as required to provide clean, straight lines and surfaces throughout.
- B. Testing: Testing of wet film thickness shall be performed a minimum of two times on each parking row (including striped islands) and pedestrian cross walks, and a minimum of one test on each lane/alignment striping. At least one test shall be performed after refilling paint striping machine, changing operators of striping machine, and changing paint types, brands, etc. This shall be performed in addition to the testing stated above. These tests shall be performed on each coat applied. Testing shall be performed in accordance with ASTM D 4414.

3.6 CLEANING

- A. Waste materials shall be removed at the end of each workday. Upon completion of the work, all containers and debris shall be removed from the site. Paint spots upon adjacent surfaces shall be carefully removed by approved procedures that will not damage the surfaces and the entire job left clean and acceptable.

END OF SECTION

SECTION 32-3223

SEGMENTAL RETAINING WALL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Segmental Retaining Wall (SRW) units, soil reinforcement, and appurtenant.
- B. Related Sections
 - 1. Section 31-2000 – Earthwork
 - 2. Section 33-4000 – Storm Drainage
- C. Contractor Voluntary Alternates: Proposals for alternate SRW systems may be submitted by the Contractor for consideration and approval by the Owner. Owner reserves the right to accept or reject any proposed Contractor Voluntary Alternates. Costs associated with submission of Contractor Voluntary Alternate shall be at the expense of Contractor.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM) Standards
 - 1. ASTM C 140 – Methods of Sampling and Testing Concrete Masonry Units
 - 2. ASTM C 150 – Portland Cement
 - 3. ASTM C 1262 – Freeze-Thaw Test for Masonry
 - 4. ASTM C 1372 – Standard Specification for Segmental Retaining Wall Units
 - 5. ASTM D 422 – Particle-Size Analysis of Soils
 - 6. ASTM D 698 – Laboratory Compaction Characteristics of Soil Using Standard Effort
 - 7. ASTM D 2166 – Triaxial Shear Test
 - 8. ASTM D 2940 – Graded Aggregate Material for Bases or Subbases for Highways or Airports
 - 9. ASTM D 3080 – Direct Shear Test
 - 10. ASTM D 4318 – Liquid Limit, Plastic Limit and Plasticity Index of Soils
 - 11. ASTM D 6938 – In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
 - 12. ASTM G 51 – Alkalinity
 - 13. ASTM G 57 – Resistivity
- B. National Concrete Masonry Association (NCMA)
 - 1. NCMA – Design Manual for Segmental Retaining Walls
 - 2. NCMA SRWU-2 – Shear Strength between Segmental Concrete units
- C. American Association of Highway and Transportation Officials (AASHTO)
 - 1. AASHTO – Standard Specifications for Highway Bridges

1.3 DEFINITIONS

- A. Soil Reinforcement: Structural geogrid or steel strips formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as structural reinforcement.
 - 1. Geosynthetic (extensible) Soil Reinforcement: Polymer product specifically manufactured as soil reinforcement element that meets requirements of this specification.
 - 2. Steel (inextensible) Soil Reinforcements: Steel strips, wires, or bars specially configured and coated for soil reinforcement applications.

- B. Segmental Concrete Facing Unit: A modular concrete facing unit machine-made from Portland cement, water, and mineral aggregates.
- C. Cap Unit: A modular concrete cap unit machine-made.
- D. Unit Drainage Fill: Free draining "open" aggregate fill which is within and between the segmental concrete facing units, and extends a minimum of 12 inches behind the units.
- E. Reinforced Backfill: Compacted soil which is within the reinforced soil volume as outlined on Construction Drawings.
- F. Foundation Soil: Compacted import or in-situ soil beneath entire wall.
- G. Retained Soil: Compacted import or in-situ soil behind reinforced zone of retaining wall.
- H. Leveling Pad: Level compacted gravel or unreinforced concrete footing upon which first course of segmental concrete facing units are placed.

1.4 SUBMITTALS

- A. Certificates of Compliance: Submit manufacturer's certification to Engineer and Owner, prior to start of work, stating that the following meet requirements of this specification:
 - 1. Soil reinforcement
 - 2. Reinforced backfill materials
 - 3. Drainage materials
- B. Samples: Submit samples of SRW units showing finish and color to the Owner for selection prior to delivery of materials as required on Construction Drawings.
- C. Design Drawings: Contractor shall furnish complete drawings, including wall profiles and all pertinent details, for installation of the SRW, sealed by licensed engineer, for any wall with stem height 48 inches and taller (total block courses above footing, including cap unit). SRW unit manufacturer's standard installation drawings and details alone may be utilized for any wall with stem height less than 48 inches.

1.5 QUALITY ASSURANCE

- A. Qualifications: SRW system installer shall have a minimum of 100,000 square feet of documentable experience installing SRW systems over eight feet in height on minimum of five projects over the previous two years. Provide the Owner a project list with current references and telephone numbers for the proposed SRW Installer substantiating the required experience.
- B. Pre-Construction Meeting: A pre-construction meeting shall be conducted by the General Contractor prior to beginning construction on segmental retaining walls. Owner's representative shall be notified of the date, time, and location of the meeting. Mandatory attendees include the General Contractor, the wall design engineer of record, the project geotechnical engineer, the Contractor's testing agency, and representatives of all sub-contractors involved with the foundation preparation, erection, and backfilling of the SRW. Meeting topics shall include, but are not limited to, schedule and phasing of wall construction, coordination with other on-site construction activities, responsibilities of parties, sources, quality, and acceptance of materials

1.6 DELIVERY, STORAGE AND HANDLING

- A. Segmental Concrete Facing Units:
 - 1. Check the materials upon delivery to assure the specified type, grade, color and texture of units have been received.
 - 2. Prevent excessive mud, wet concrete, epoxies, and like materials which may affix themselves from coming in contact with the materials.

3. Protect the materials from damage.
- B. Soil Reinforcement:
1. Check the soil reinforcement upon delivery to assure the proper grade and type of material been received. Provide a product certification with each shipment.
 2. Store soil reinforcement material in accordance with manufacturer's recommendations.
- C. Drainage Materials:
1. Store plastic pipe in accordance with the manufacturer's recommendations to prevent deleterious materials from becoming affixed or deterioration from sun exposure.
 2. Store drainage aggregate to prevent contamination with other materials.

PART 2 - PRODUCTS

2.1 SEGMENTAL CONCRETE FACING UNITS

- A. Manufacturers: Provide one of the following
1. KEYSTONE
 2. VERSA-LOK
 3. REINFORCED EARTH COMPANY
 4. ANCHOR
 5. MESA
- B. Color and finish shall be as directed by the Owner or as shown in the Drawings.
- C. Facing units shall meet the following structural requirements:
1. SRW Shear Capacity: Concrete units shall have a demonstrated shear capacity to withstand laterally applied shear loads as defined in the design calculations. Shear capacity shall be demonstrated through full-scale testing of SRW facing system according to NCMA SRWU-2 test method. Shear capacity shall be defined both with and without the soil reinforcement present at the interface.
 2. Units shall be manufactured in accordance with ASTM C 1372.
 3. Concrete wall units including cap units shall have minimum 28-day compressive strength of 4,000 psi on the net area and have a maximum absorption rate of 6 percent.
 4. Cementitious materials used in manufacture of units shall be Type I, Type II or Type III Portland cement in accordance with ASTM C 150.
 5. In areas where repeated freezing and thawing under saturated conditions occur, freeze-thaw durability shall be demonstrated by testing per ASTM C 1262. Testing shall be conducted for a minimum 100 cycles, and weight loss shall not exceed one percent.
 6. Other Constituents: Air entraining agents, coloring pigments, integral water repellents, finely ground silica and other constituents shall be previously established as suitable for use in retaining wall units or shall be shown by test or experience not to be detrimental to the durability of segmental concrete facing units or to any material used in masonry construction.
 7. Dimensional tolerances for exterior molded units shall be in accordance with ASTM C 1372. SRW concrete facing unit molded dimensions shall not differ more than $\pm 1/8$ inch from the manufacturer's published dimensions, except for height which shall be $\pm 1/16$ inch. Maximum differential shall be no more than $1/8$ inch in height from front to back of unit.
 8. SRW units shall provide minimum effective in-place weight equivalent to 100 pcf. Fill placed within dimensions of units may be considered as integral to the effective unit weight. This in-place weight shall be determined by testing and used for all design calculations.
 9. Units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the construction.

2.2 BASE LEVELING PAD MATERIAL

- A. Base leveling pad material shall be crushed dense aggregate base material or lean non-reinforced 2,000 psi concrete.

2.3 UNIT FILL

- A. Unit fill shall be free-draining crushed stone or crushed gravel conforming to SRW manufacturer's recommendations.

2.4 SOIL REINFORCEMENT

- A. Geosynthetic Soil Reinforcement:
 - 1. Properties: The geosynthetic soil reinforcement shall possess minimum strength and durability required by design as determined by product specific testing as defined in the NCMA Design Manual for Segmental Retaining Walls (Section 3.5), including provisions for minimum partial safety factors. Design submittal shall indicate the index tensile strength for each reinforcement type to be used in construction.
 - 2. Geogrid:
 - a. Stratagrid
 - b. Nicolon/Mirafi
 - c. Tensar (Black Sb Series Geogrids Only)
- B. Steel Soil Reinforcement:
 - 1. Steel soil reinforcement shall possess minimum strength and durability at end of design life of structure in accordance with AASHTO Standard Specification for Highway Bridges including provisions for corrosion and manufacturer's recommendations.
 - 2. Steel (inextensible) soil reinforcement shall be provided by the following manufacturers:
 - a. Reinforced Earth Company.

2.5 DRAINAGE MATERIALS

- A. Drainage collection pipe shall be perforated/slotted PVC or corrugated HDPE pipe as specified in Section 33-4000. The pipe shall be covered with a knitted or non-woven geotextile sock specifically designed to function as a filter.
- B. Drainage aggregate shall be free-draining material, relative to the surrounding soil conforming to the SRW manufacturer's recommendations in order to prevent build-up of hydrostatic pressure.
- C. Drainage geotextile shall be non-woven fabric of polypropylene or polyester fibers. Acceptable products include Mirafi 140N or S600 (TenCate Geosynthetics), or approved equal.
- D. Drainage composite shall be J-DRain 400 (JDR Enterprises, Inc.), Hydroduct 200 (Grace Construction Products), Sure Drain Type V (Carlisle Coatings & Waterproofing), or approved equal.

2.6 REINFORCED WALL BACKFILL

- A. Reinforced soil shall possess the following characteristics:
 - 1. Less than 35% passing the No. 200 sieve per ASTM D 422 with a maximum size of 3/4 inches (4 inch maximum for steel reinforced systems)
 - 2. A liquid limit < 40 and a plasticity index < 10 per ASTM D 4318
 - 3. An effective angle of internal friction > 30° per ASTM D 2166 or D 3080 at the compaction standard. Use of an effective friction angle greater than 30 degrees for design shall be verified by appropriate testing submitted to and approved by the owner's engineer prior to construction.
 - 4. Less than 5% organic material
- B. Backfill reinforced with geosynthetic shall have a pH in the range of 3 to 9 per ASTM G 51.

- C. Backfill reinforced with steel reinforcement shall have a pH in the range of 5 to 10 per ASTM G 51, minimum resistivity of 3000 ohm-cm at 100% saturation per ASTM G 57 and free of sulfates > 200 ppm or chlorides > 100 ppm. If the resistivity is \geq 5000 ohm-cm, the chloride and sulphate requirements are waived.

2.7 RETAINED BACKFILL OR COMMON BACKFILL

- A. Soil placed behind the reinforced backfill shall be satisfactory fill material as specified in Section 31-2000.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Comply with federal, state and local requirements for execution of the work, including local building codes and current OSHA excavation regulations. Provide excavation support as required to maintain stability of the area during excavation and wall construction and to protect existing structures, utilities, landscape features, or property or improvements.
- B. Prior to grading or excavation of the site, confirm the location of the retaining walls and all underground features, including utility locations within the area of construction. Ensure surrounding structures are protected from effects of wall excavation.
- C. Coordinate installation of underground utilities with wall installation.
- D. Control surface water drainage and prevent inundation of the retaining wall area during construction.

3.2 EXCAVATION

- A. Excavate to lines and grades shown on the Construction Drawings. Take precautions to minimize over-excavation. Over-excavation shall be backfilled with approved compacted material.
- B. Inspect excavation prior to placement of leveling pad material.
- C. In areas where soft, disturbed or otherwise unsuitable soils are encountered within the zone of the wall loading in the excavations, such unsuitable soils shall be over-excavated to the depths and extents required and replaced with select material and compacted per the contract documents.
- D. Fill over-excavated areas in front of wall face with approved compacted material before wall construction reaches 4 feet in height.
- E. In areas where a retaining wall or portion of a retaining wall is to be installed into cut, the required excavation shall extend horizontally to the extent of the reinforced zone and vertically to the elevation of the top of the leveling pad. The retained zone shall be bench cut in order to permit controlled placement of retained backfill.

3.3 LEVELING PAD CONSTRUCTION

- A. Place leveling pad as shown on the Construction Drawings with minimum 6 inches of crushed dense aggregate base or minimum 8 inches of lean concrete. The leveling pad shall extend laterally a minimum distance of 6 inches from the toe and heel of the lower-most SRW Unit in accordance with manufacturer's recommendations.
- B. Foundation soil shall be proofrolled and the top 12 inches compacted to minimum 95 % Standard Proctor Maximum Dry Density (ASTM D 698) and tested prior to placement of leveling pad materials.

- C. Compact granular leveling pad material to provide a level hard surface on which to place the first course of units. Compact with mechanical plate compactors to minimum 95 % of Standard Proctor Maximum Dry Density (ASTM D 698).

3.4 SRW UNIT INSTALLATION

- A. Place first course of SRW units on the leveling pad. Level units side-to-side, front-to-rear and aligned with adjacent units.
- B. Ensure units are in full contact with base.
- C. Place the fronts of the units side-by-side without gaps between the fronts of adjacent units. Layout of curves and corners shall be in accordance with SRW manufacturer's installation guidelines.
- D. Install mechanical fascia connections per SRW manufacturer's recommendations.
- E. Place and compact unit drainage fill within, between, and behind units. Place and compact infill soil behind drainage fill. Mechanical vibrating plate compactors shall not be used on top of the units. Compact fill between units and the three-foot zone behind the units by running hand-operated compaction equipment just behind units. Compact to minimum 80 % Relative Density (ASTM D 2940).
- F. Place core drainage fill in the previous course of units prior to stacking of subsequent segmental retaining wall units.
- G. Clean excess debris from top of units.
- H. Repeat procedure to the extent of wall height.

3.5 SOIL REINFORCEMENT INSTALLATION

- A. Soil reinforcement shall be oriented with the highest strength axis perpendicular to the wall alignment.
- B. Install soil reinforcement to wall height, horizontal location, and extent as shown on the Drawings.
- C. Lay the soil reinforcement horizontally on compacted backfill. Pull geogrid taut and connect to concrete SRW units according to connection detail shown on the Drawings or as recommended by manufacturer prior to backfill placement on geosynthetic reinforcement.
- D. Soil reinforcements shall be continuous throughout their embedment lengths. Spliced connections between shorter pieces will not be allowed.
- E. Do not operate tracked construction equipment directly upon soil reinforcement. Provide a minimum fill thickness of 6 inches prior to operation of tracked equipment over soil reinforcement. Keep tracked vehicle turning to minimum to prevent tracks from displacing the fill and damaging soil reinforcement.
- F. Rubber-tired equipment may pass over soil reinforcement at low speeds (less than 10 mph) if permitted by the manufacturer. Avoid sudden braking and sharp turning.
- G. Changes to soil reinforcement layout, including, but not limited to, length, soil reinforcement type (strength), or elevation, may be made subject to approval of the Engineer.
- H. Verify orientation (Roll direction) of geosynthetic reinforcement.

3.6 REINFORCED BACKFILL PLACEMENT

- A. Place reinforced backfill, spread and compact in such a manner that will not develop slack in the soil reinforcement in accordance with Manufacturers recommendations.
- B. Place and compact reinforced backfill in lifts not to exceed 8 inches in compacted thickness.
- C. Compact reinforced backfill to a minimum of 95 % Standard Proctor Maximum Dry Density (ASTM D 698) at a moisture content from 2 % below to 2 % above optimum
- D. Compact reinforced backfill in all areas to the lines and grades shown on the Construction Drawings including all sloped areas above walls.
- E. At the end of each day's operation, slope the last lift of reinforced backfill away from the wall facing to rapidly direct runoff away from the wall face. Do not allow surface runoff from adjacent areas to enter the wall construction site.

3.7 RETAINED BACKFILL PLACEMENT

- A. Retained backfill shall be placed in maximum 8 inch thick compacted lifts and compacted to minimum 95 % Standard Proctor Maximum Dry Density (ASTM D 698).

3.8 DRAINAGE SYSTEM

- A. Drainage Collection Pipe:
 - 1. Install the drainage collection pipe according to line, grades and sections shown on the Drawings.
 - 2. Install drainage collection pipe to maintain gravity flow of water from reinforced soil zone. Daylight drainage collection pipe at storm sewer manhole or along slope at an elevation lower than lowest point of pipe within reinforced soil mass, every 40 feet minimum.
 - 3. Main collection drain pipe just behind segmental units shall be minimum 4 inches in diameter. Secondary collection drain pipe shall gravity flow independently or tie into main collection drain pipe with laterals at maximum 40 foot spacing along wall face.
- B. Drainage Aggregate:
 - 1. Install drainage aggregate to line, grades, and sections shown on the Drawings.
 - 2. When blanket drain is installed, non-woven geotextile shall be installed prior to aggregate placement in accordance with the Drawings.
- C. Drainage Composite:
 - 1. Install drainage composite as shown on the Drawings.
 - 2. Wrap upper ends of drainage composite with approved geotextile fabric.
 - 3. Drainage composite shall extend upwards minimum of 2/3 of height of backcut and be spaced on horizontal centers to give a minimum of 50% to 100% horizontal coverage as required.
 - 4. Drainage composite shall terminate in a french drain effectively connecting to a collector pipe wrapped in drainage aggregate and an approved geotextile fabric.

3.9 SRW CAP INSTALLATION

- A. Place SRW Cap units per manufacturer's recommendations. Backfill and compact to finished grade.
- B. Incorporate surface water drainage control (swale) into finished grading at top of wall, as shown on the Drawings.

- C. Attach cap units to wall units with construction epoxy. Apply epoxy to bottom surface of cap unit and install on clean units below. Follow epoxy manufacturer's directions to ensure permanent bond.

3.10 CONSTRUCTION

- A. SRW Tolerances: Installation of SRW face location shall be within all the following tolerances:
 - 1. Vertical control from plan: ± 1.25 inches over a 10 ft. distance.
 - 2. Horizontal location control from plan:
 - a. Straight lines: ± 1.25 inches over a 10 ft. distance.
 - b. Straight & radius corner locations: ± 1.0 ft.
 - c. Curves and serpentine radius: ± 2.0 ft.
 - 3. Rotation of the wall face during construction:
 - a. Maximum 2.0 degrees from established wall plan batter.
 - b. Maximum, ± 10.0 % from total established horizontal setback.
 - 4. Bulging: ± 1.25 inches over a 10.0 ft. distance.
- B. Mechanical vibrating plate compactors shall not be used on top of the units. Compact fill between units and the backfill zone behind the units by running hand-operated compaction equipment just behind units. Perform compaction to manufacturer's recommendations.

3.11 FIELD QUALITY CONTROL

- A. The Contractor shall engage inspection and testing service agencies, including independent laboratories, to provide quality control and testing services during construction. The Owner may engage a testing and inspection agency for quality assurance, but this does not relieve the General Contractor from providing the specified construction quality control and testing.
- B. Testing and inspection services shall be performed by trained and experienced technicians currently qualified for the work to be performed.
- C. The testing agency shall submit written reports of inspections to the Contractor on weekly basis. Such reports shall include description of work performed, deficiencies noted in construction, and corrective action taken to resolve such deficiencies. Owner shall be notified directly by the Contractor's testing agency of deficiencies noted by testing agency and provided with a summary and schedule for corrective action. Written reports will also include location, type, and results of all tests taken on the Project.
- D. The Contractor shall provide a certification to the Owner that the completed SRW has been installed in accordance with the contract documents.
- E. Segmental Retaining Wall Units:
 - 1. Compressive strength test specimens shall conform to the saw-cut coupon provisions of Section 5.2.4 of ASTM C 140 with the following exceptions:
 - a. Coupon shall have a minimum thickness of 1-1/2 inches.
 - b. Coupon shall not be oven dried before testing.
 - 2. The compressive strength shall be considered the average of three or more test coupons.
 - 3. Run compressive strength testing for every 7,500 square feet of installed wall facing material or fraction thereof. Perform testing immediately upon receipt from laboratory.
- F. Soil and Backfill Testing: Unless otherwise directed by the Owner or required by this technical scope of work, type and minimum frequency of testing for soils-related portions of construction shall be as follows.
 - 1. Field density tests in accordance with ASTM D 6938:
 - a. Subgrade Soils: One test for every 2,500 square feet per lift of material
 - b. Base Leveling Pad: One test for every 100 lineal feet
 - c. Reinforced Backfill: One test for every 2,500 square feet per lift. Testing shall be performed on every other lift.

2. Laboratory moisture-density relationships, ASTM D 698: One test for every compacted material type.
3. Gradation Analysis, ASTM D 422:
 - a. Unit Fill: One test for every 500 cubic yards of material
 - b. Reinforced Backfill: One test for every 500 cubic yards of material or when material type changes.

END OF SECTION

SECTION 32-9343

TREE PROTECTION AND REMOVAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Contractor shall provide protection of existing trees or other designated plant material in order to maintain a healthy, vigorous condition.
- B. Contractor shall perform tree removal, stump grinding and pruning as specified, utilizing acceptable horticultural standards as adopted by the Texas Association of Landscape Contractors (TALC) OR Texas Nurseryman Association. Such work shall include, but is not limited to, the following:
 - 1. Protection of existing trees to remain.
 - 2. Site clearing and removal through chipping of trees and understory vegetation designated for removal.
 - 3. Shredding of chipped material a minimum of 2 times to produce mulch for use onsite.
 - 4. Stockpiling of shredded chipped material for use as mulch for landscape installation.
 - 5. Pruning or repairing trees damaged due to site clearing operations.
- C. Related Sections
 - 1. Section 31-1000 – Site Clearing.
 - 2. Section 31-2500 – Erosion and Sedimentation Control
 - 3. Construction Drawings

1.2 REFERENCES

- A. American National Standards Institute (ANSI)
- B. American Nursery and Landscape Association (ANLA)

1.3 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize flagmen, barricades, warning signs, and warning lights as required.

1.4 INSPECTION OF THE SITE

- A. The Contractor shall visit the site to inspect the conditions with the Owner's Representative prior to commencing work. The Contractor shall verify with the Owner's Representative the extent of tree protective fencing and specific trees with understory vegetation to be chipped, removed and stockpiled.

PART 2 - PRODUCTS

2.1 WOUND PAINT

- A. For trees within protection fencing area that may have received damage due to adjacent clearing, apply only acceptable arboriculture recommended products.

2.2 TREE PROTECTION FENCING (CHAIN LINK)

- A. Unless otherwise shown on Construction Drawings, fence fabric shall be hot-dipped, galvanized, eleven gauge, 2-inch mesh, 4-foot height.

- B. Unless otherwise shown on Construction Drawings, fence posts shall be minimum 1.5 inch outside diameter, 8-feet on center maximum spacing.

PART 3 - EXECUTION

3.1 PERSONNEL

- A. The Contractor shall furnish personnel licensed in the removal, chipping and stockpiling of mulch from trees and understory vegetation cleared from the site.

3.2 FIELD VERIFICATION

- A. The Contractor shall field verify with the Owner's Representative trees to be removed prior to commencing work. Receive approval from Owner's Representative for trees scheduled to be removed.

3.3 TREE PRESERVATION

- A. In order to avoid damage to roots, bark, or lower branches, no truck or other equipment shall be driven or parked within drip line of any tree, unless tree overspreads paved area.
- B. Do not clean construction equipment nor perform field maintenance on vehicles in the vicinity of the trees to be preserved.
- C. Repair injuries, abrasions and other damage to plants by cleanly removing broken members, loose and torn bark, and shape edges to permit drainage of rain water from wounds. Paint wounds with an approved tree wound paint as necessary.
- D. Use precautionary measures when performing work around trees, sidewalks, pavements, utilities, and other features either existing or previously installed.
- E. Adjust depth of earthwork and topsoil when working immediately adjacent to aforementioned features in order to prevent disturbing tree roots, undermining sidewalks and pavements, and damage in general to other features either existing or previously installed.
- F. Where excavating, fill, or grading is required within drip line of trees that are to remain, work shall be performed as follows:
 - 1. Trenching: When trenching occurs around trees to remain, tree roots shall not be cut but trench shall be tunneled under or around roots by careful hand digging without injury to roots.
 - 2. Raising Grades:
 - a. Where fill not exceeding 16 inches is required, clean, washed gravel graded from 1 inch to 2 inches in size shall be placed directly around tree trunk. Extend gravel out from trunk on all sides minimum of 18 inches and finish approximately 2 inches above finished grade at tree. Install gravel before any earth fill is placed. New earth fill shall not be left in contact with trunks of trees requiring fill.
 - b. Where fill exceeding 16 inches is required, construct dry-laid tree well around trunk of tree. Tree well shall extend out from trunk on all sides minimum of 3 feet and to 3-inches above finish grade. Place coarse-graded rock directly around tree well extending out to drip line of tree. Place clean, washed gravel graded from 1 inch to 2 inches in size directly over coarse rock to depth of 3 inches. Place approved backfill material directly over washed gravel to desired finish grade.
 - 3. Lowering Grades: Existing trees in areas where new finish grade is to be lowered shall have re-grading work done by hand to elevation indicated on Construction Drawings. Roots as required should be cut cleanly 3 inches below finished grade and scars covered with tree paint.
 - 4. Trees marked for preservation that are more than 6 inches above proposed grades shall stand on broad rounded mounds and graded smoothly into lower level. Trees located

more than 16 inches above proposed grades shall have dry-laid stone wall or other retaining structure as detailed on Construction Drawings constructed minimum of 5 feet from trunk. Exposed or broken roots shall be cut clean and covered with topsoil.

3.4 TREE AND UNDERSTORY VEGETATION REMOVAL

- A. Receive approval from the Owner's Representative in the field for trees to be removed. Fell trees to avoid injuring protected trees and undergrowth or damaging utilities. Use felling methods that comply with OSHA and American Association of Nurserymen.
- B. Chip trees and vegetation scheduled for removal. Chipping procedures for tree and understory vegetation shall comply with OSHA and American Association of Nurserymen.
- C. Shred chipped material a minimum of 2 times to produce mulch that is less than 3" in length.
- D. Stockpile shredded chipped material in designated location as directed by the General Contractor and Owner's Representative and in accordance with codes and regulation so the jurisdictional authorities. Stockpiled mulch to be used for compost seeding of lawns and for topdressing at trees and shrubs.
- E. Burning and burying debris on the worksite is prohibited.

3.5 WATERING

- A. Deep root water existing trees along east edge of protected area once every two weeks during the summer and once a month during the winter, during the duration of the project and until final acceptance. This should be adjusted to the amount of rain. However, unless it has rained at least 0.5" since the last watering, continue to deep root water. For large masses of protected trees, water trees that are located along the outside edge of protected area as described above

3.6 MAINTENANCE OF EXISTING TREES

- A. Trees shall continuously and routinely be inspected for distress caused by construction activities. Notify Owner's representative at first sign of distress.
- B. Any fire ant mounds around or on top of a tree root zone shall be treated immediately and the mound removed physically. Do not allow the mound to build on the tree trunk as this will cover the tree root flare and possibly cause injury or death. Insure that any chemical application to the Fire Ant mound is safe for application atop tree root zones. Ant mounds do not need to be treated in tree masses.
- C. Trees: Pruning will be carried out by experienced pruning personnel
 1. Receive approval in the field for extent of pruning of damaged trees from Owner's Representative.
 2. Sterilize pruning tools between individual plants, especially in the genus Quercus. Paint all wounds on plants of the genus Quercus with wound paint as soon as possible. Paint deliberate wounds (pruning) within one hour. Paint accidental wounds (storm or equipment damage or vandalism) as soon as they are observed.
 3. Remove branches larger than two-inch diameter with 3-step cut.
 4. Pruning will be carried out by experienced pruning personnel.
 5. Raise limbs to an acceptable height as approved by the Owner's Representative. Raise limbs to seven-foot height for trees within 10 feet of parking or sidewalk.
 6. No weed-eaters or edgers are to be used within 15 inches of any tree. Should the need for trimming be necessary within 15 inches of any tree, it shall be done so by hand trimming only.

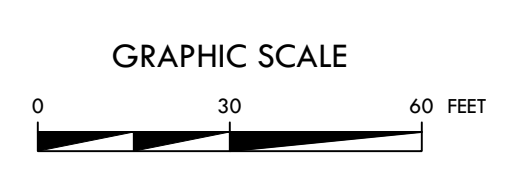
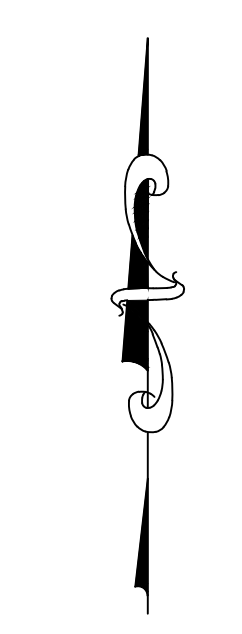
3.7 CLEANUP

- A. Remove and dispose of protective materials, enclosures and fencing upon completion of the Work.

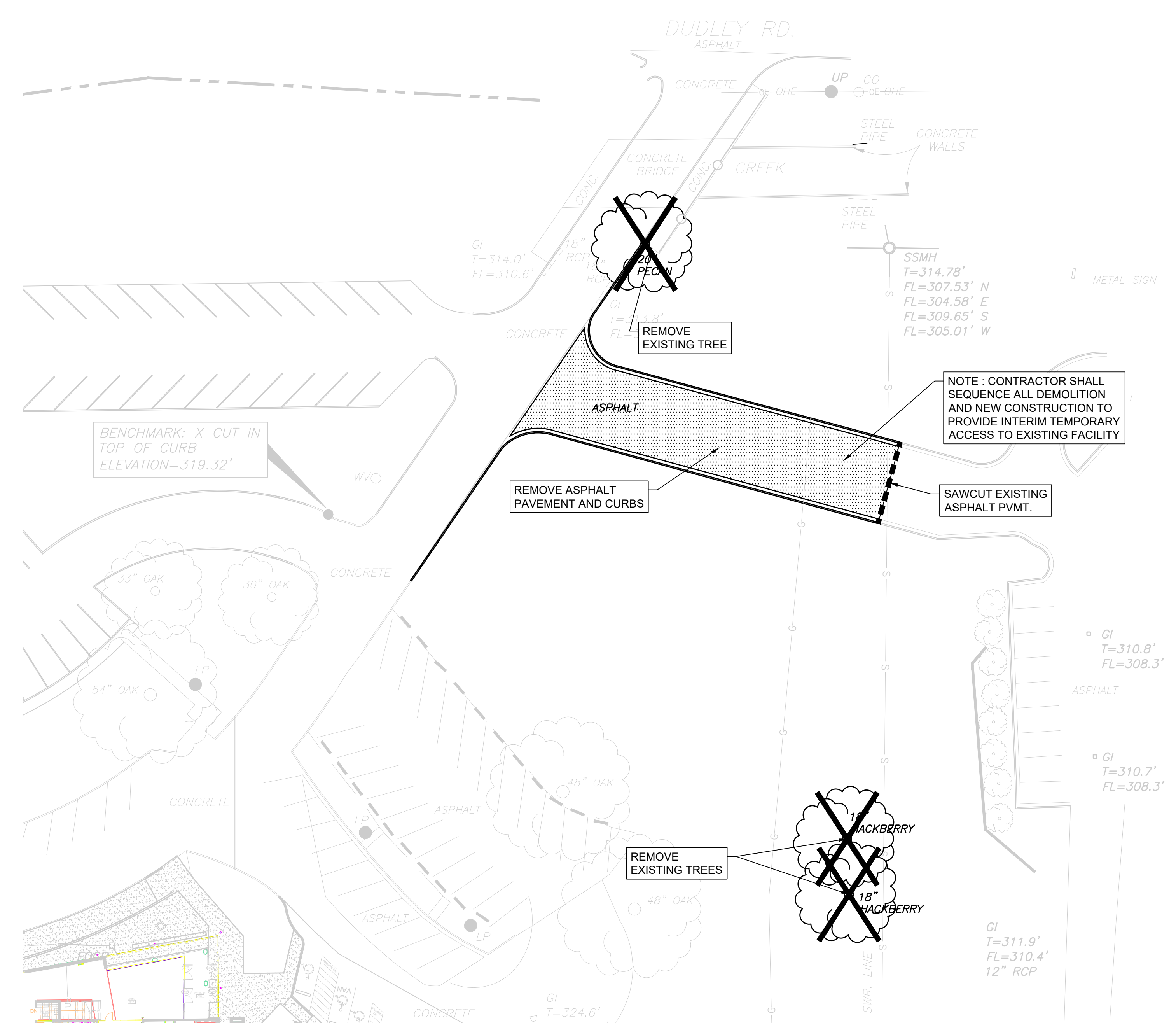
3.8 FINAL ACCEPTANCE

- A. Receive approval from the Owner's Representative for the work of this section.

END OF SECTION



LEGEND	
SAWCUT	
PAVEMENT REMOVAL	
REMOVE TREE	



!!!CAUTION!!!
 EXISTING OVERHEAD & UNDERGROUND UTILITIES IN THE VICINITY.
 VERIFY LOCATION OF EXISTING UNDERGROUND UTILITIES
 BY VACUUM EXCAVATION OR OTHER POTHOLES TECHNIQUES.

**** NOTICE TO CONTRACTORS - TOPOGRAPHIC SURVEY ****

TOPOGRAPHIC INFORMATION TAKEN FROM A TOPOGRAPHIC SURVEY PERFORMED BY SUMMIT SURVEYING, INC. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY, IN WRITING, OF ANY DISCREPANCIES OR OMISSIONS TO THE TOPOGRAPHIC INFORMATION. THE CONTRACTOR(S) SHALL BE RESPONSIBLE FOR CONFIRMING THE LOCATION (HORIZONTAL/VERTICAL) OF ANY BURIED CABLES, CONDUITS, PIPES, AND STRUCTURES (STORM SEWER, SANITARY SEWER, WATER, GAS, TELEVISION, TELEPHONE, ETC.) WHICH IMPACT THE CONSTRUCTION SITE. THE CONTRACTOR(S) SHALL NOTIFY THE OWNER AND ENGINEER IF ANY DISCREPANCIES ARE FOUND BETWEEN THE ACTUAL CONDITIONS VERSUS THE DATA CONTAINED IN THE CONSTRUCTION PLANS. ANY COSTS INCURRED AS THE RESULT OF NOT CONFIRMING THE ACTUAL LOCATION (HORIZONTAL/VERTICAL) OF SAID CABLES, CONDUITS, PIPES, AND STRUCTURES SHALL BE BORNE BY THE CONTRACTOR. ADDITIONALLY, THE CONTRACTOR(S) SHALL NOTIFY THE OWNER AND ENGINEER IF ANY ERRORS OR DISCREPANCIES ARE FOUND ON THE CONSTRUCTION DOCUMENTS (PSS&E) WHICH NEGATIVELY IMPACT THE PROJECT. THE ENGINEER AND OWNER SHALL BE INDEMNIFIED OF PROBLEMS AND/OR COST WHICH MAY RESULT FROM CONTRACTOR'S FAILURE TO NOTIFY ENGINEER AND OWNER.

****NOTICE TO CONTRACTORS - UTILITIES****

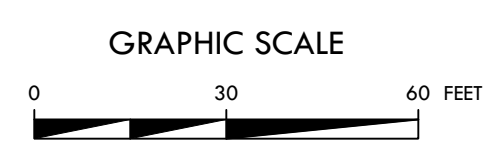
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF ANY EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, THE GOVERNING MUNICIPALITY, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION PROVIDED IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS.

Date	Description	No.
Revisions		
		08-11-2024
LANGAN Langan Engineering and Environmental Services, LLC 1101 ESE Loop 323, Suite 101 Tyler, TX 75701 T: 903.324.8400 www.langan.com TBPE FIRM REG. #F-13709		
Project		
ROY H. LAIRD HEALTH SCIENCES EDUCATION CENTER		
Drawing Title		
DEMOLITION PLAN - NE PARKING LOT		
Project No.	Drawing No.	
532012701	C1.0	
Date	2/15/24	
Drawn By	TMC	
Checked By	RDM	
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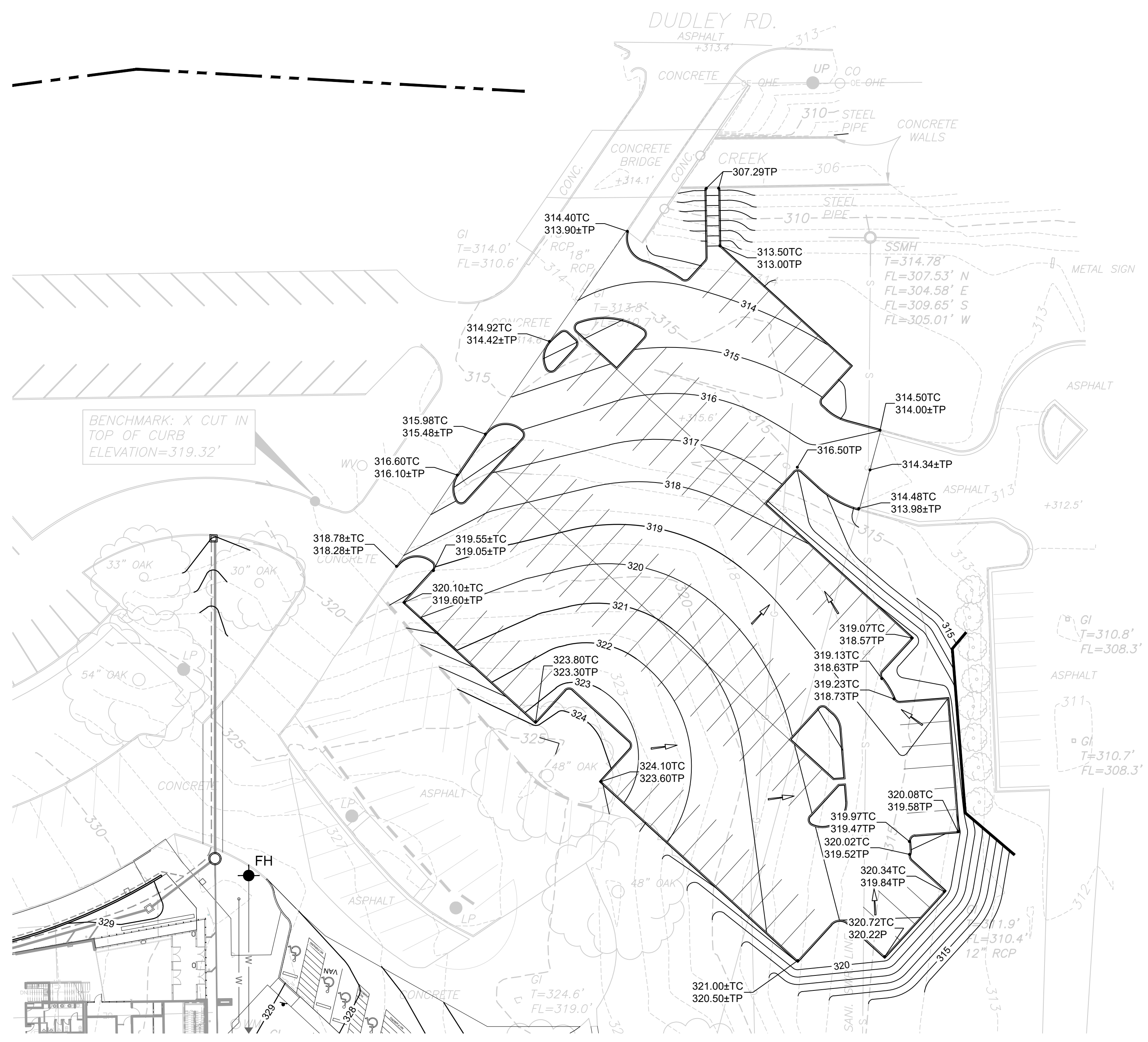


Know what's below.
 Call before you dig.

THESE PLANS ARE SUBJECT TO REVIEW & APPROVAL BY JURISDICTIONAL ENTITIES.



LEGEND	
PROPOSED CONTOUR	— 100 —
EXISTING CONTOUR	- - - - -
FLOWLINE	— · — · —
SPOT GRADE	● 100.00 TP
EXISTING FLOW ARROW	→
PROPOSED FLOW ARROW	→
FG	FINISHED GRADE
TP	TOP OF PAVEMENT
FL	FLOWLINE



SITE GRADING

THE GROUND IMMEDIATELY ADJACENT TO THE FOUNDATION SHALL BE SLOPED AWAY FROM THE BUILDING AT A SLOPE OF NOT LESS THAN ONE UNIT VERTICAL IN 20 UNITS HORIZONTAL (5-PERCENT SLOPE) FOR A MINIMUM DISTANCE OF 10 FEET (3048 MM), MEASURED PERPENDICULAR TO THE FACE OF THE WALL. IF PHYSICAL OBSTRUCTIONS OR LOT LINES PROHIBIT 10 FEET (3048 MM) OF HORIZONTAL DISTANCE, A 5-PERCENT SLOPE SHALL BE PROVIDED BY AN APPROVED ALTERNATIVE METHOD OF DIVERTING WATER AWAY FROM THE FOUNDATION. SWALES USED FOR THIS PURPOSE SHALL BE SLOPED A MINIMUM OF 2 PERCENT WHERE LOCATED WITHIN 10 FEET (3048 MM) OF THE BUILDING FOUNDATION. IMPERVIOUS SURFACES WITHIN 100 FEET (3048 MM) OF THE BUILDING FOUNDATION SHALL BE SLOPED A MINIMUM OF 2 PERCENT AWAY FROM THE BUILDING.

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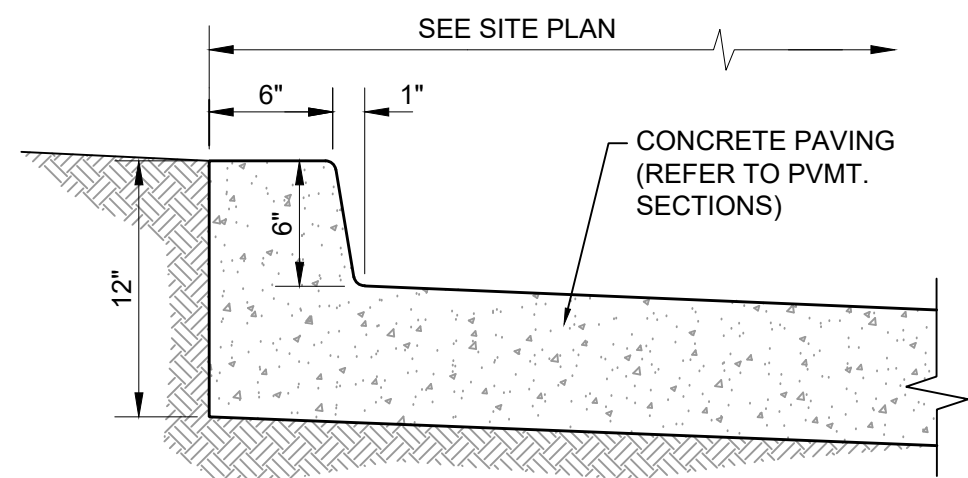
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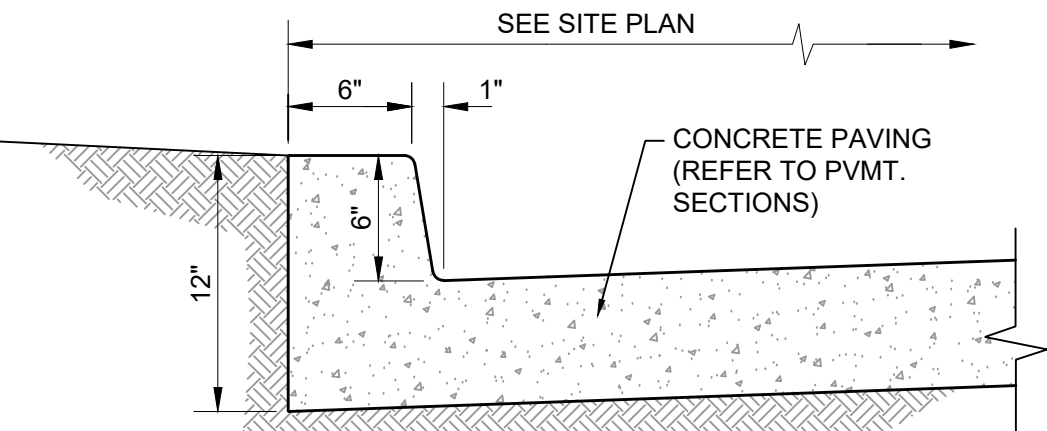
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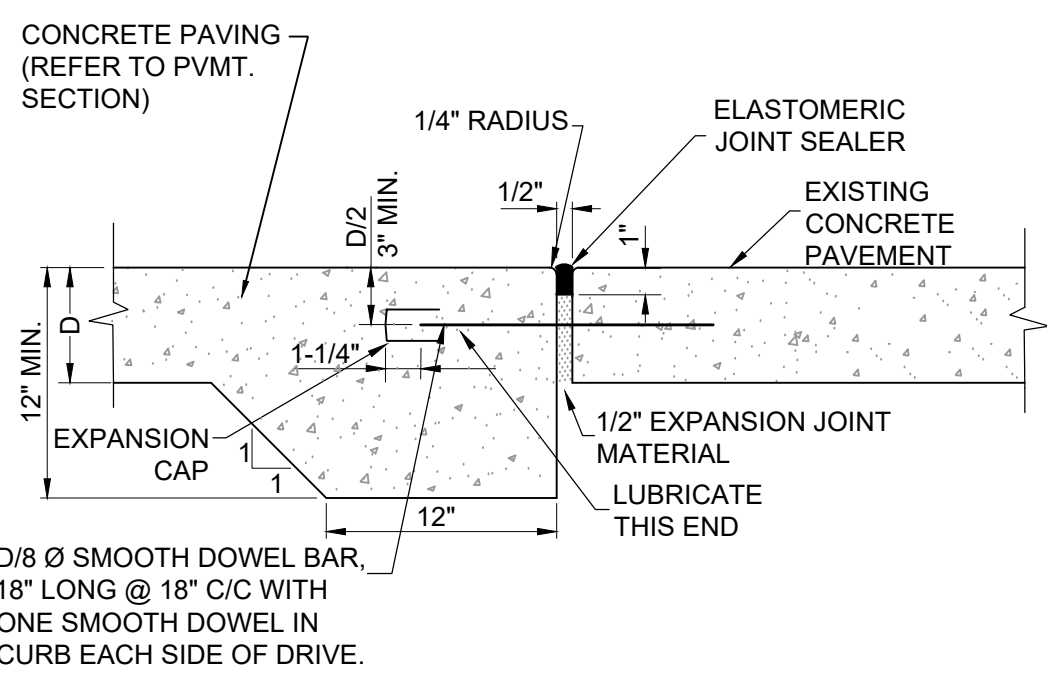
NOTES:
 1. ALL SUBGRADE PREPARATION AND BASE MATERIAL (PER THE PAVEMENT SECTIONS) SHALL EXTEND A MINIMUM OF 12 INCHES BEHIND THE BACK OF CURB.
 2. REFER TO SITEWORK SPECIFICATIONS FOR CONCRETE STRENGTH.
 3. PAVEMENT JOINTS SHALL EXTEND THROUGH CURB SECTION.

MONOLITHIC SPILL CURB DETAIL
 N.T.S.

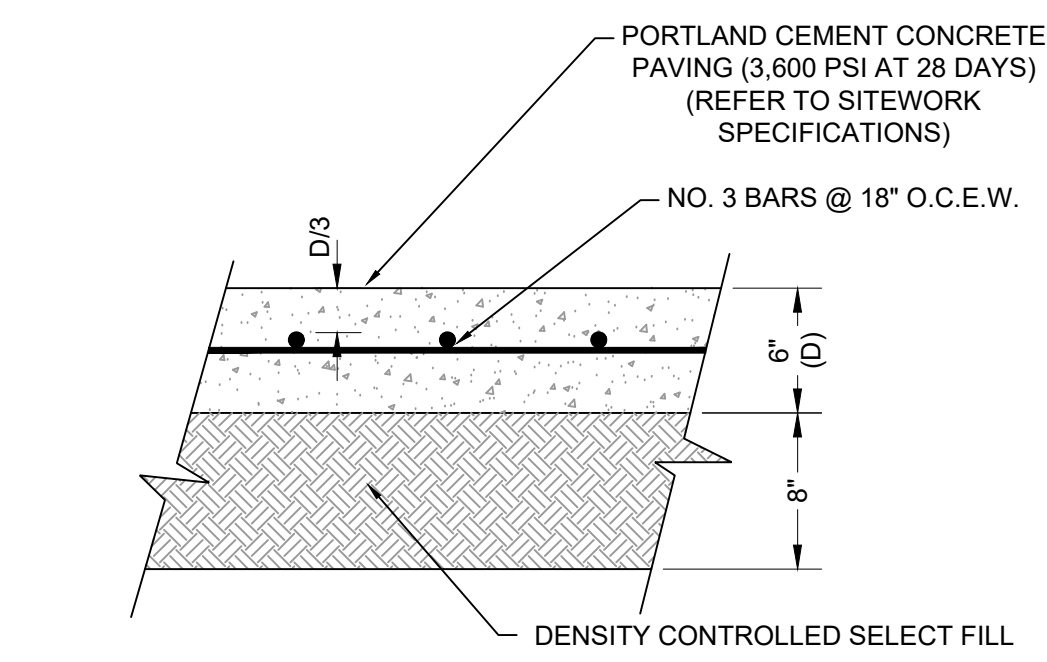


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MONOLITHIC CATCH CURB DETAIL
 N.T.S.



CONCRETE PAVEMENT CONNECTION TO EXISTING CONCRETE PAVEMENT
 N.T.S.



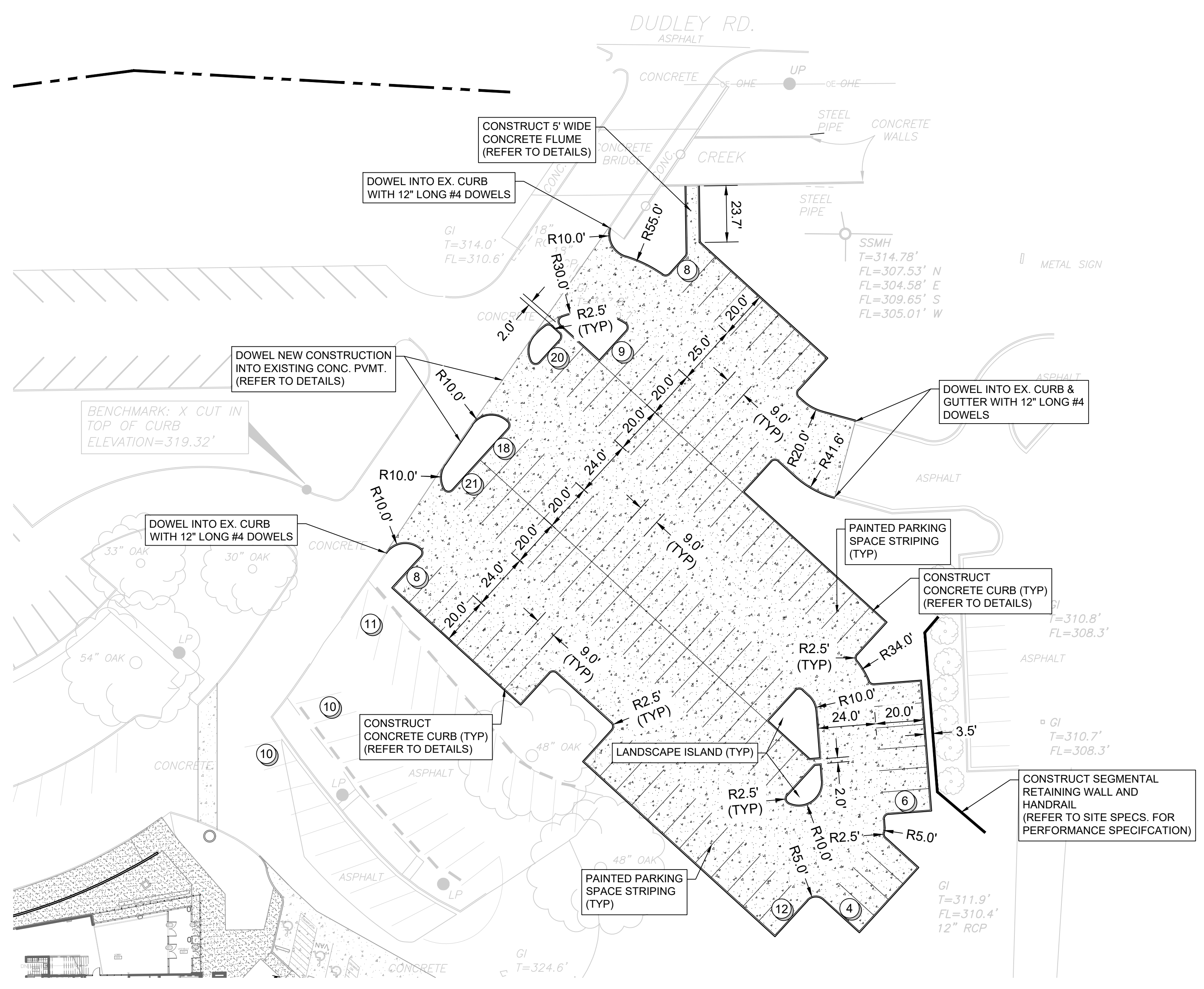
NOTES:
 REFER TO SITEWORK SPECIFICATIONS FOR THE FOLLOWING:
 • ASPHALT, BASE AND CONCRETE PAVEMENT INSTALLATION INSTRUCTIONS
 • CONTROL AND EXPANSION JOINT SPACING LAYOUT AND DOWEL USAGE REQUIREMENTS.
 • SUBGRADE PREPARATION INSTRUCTIONS

PORTLAND CEMENT CONCRETE PAVEMENT SECTIONS
 N.T.S.

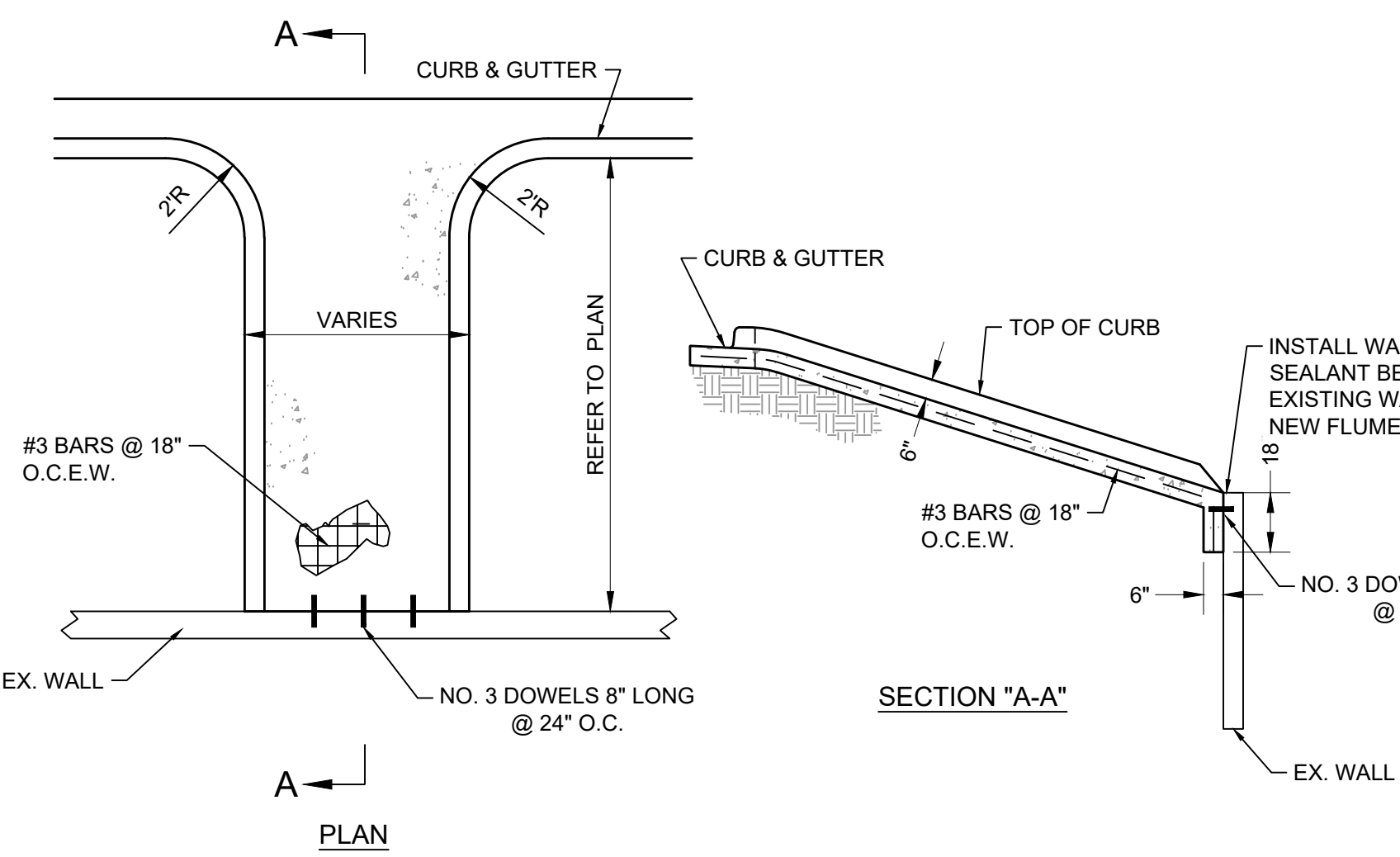
PAVEMENT SECTIONS WERE TAKEN FROM THE GEOTECHNICAL REPORT PREPARED BY BRAUN INTERTEC, TYLER TX (JOB NO. 82102586) AND THEREFORE DO NOT FALL UNDER THE ENGINEERS SEAL. SHOWN HEREON. REFER TO GEOTECHNICAL REPORT AND SITEWORK SPECIFICATIONS FOR ANY CLARIFICATIONS OR DISCREPANCIES.

****NOTICE TO CONTRACTORS - UTILITIES****
 THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF ANY EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES. THE GOVERNING MUNICIPALITY, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION PROVIDED IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS.

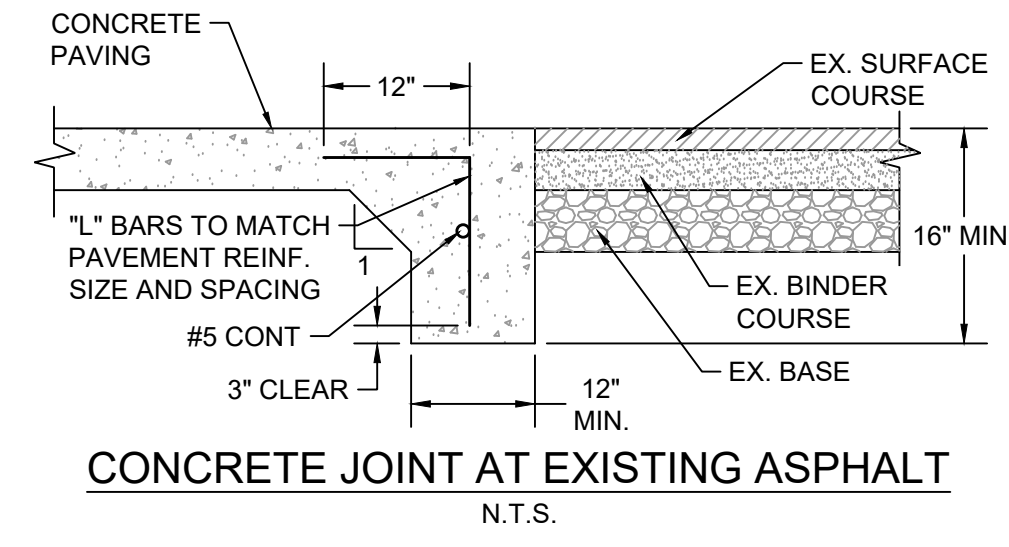
**** NOTICE TO CONTRACTORS - TOPOGRAPHIC SURVEY ****
 TOPOGRAPHIC INFORMATION TAKEN FROM A TOPOGRAPHIC SURVEY PERFORMED BY SUMMIT SURVEYING, INC. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY, IN WRITING, OF ANY DISCREPANCIES OR OMISSIONS TO THE TOPOGRAPHIC INFORMATION. THE CONTRACTOR(S) SHALL BE RESPONSIBLE FOR CONFIRMING THE LOCATION (HORIZONTAL/VERTICAL) OF ANY BURIED CABLES, CONDUITS, PIPES, AND STRUCTURES (STORM SEWER, SANITARY SEWER, WATER, GAS, TELEVISION, TELEPHONE, ETC.) WHICH IMPACT THE CONSTRUCTION SITE. THE CONTRACTOR(S) SHALL NOTIFY THE OWNER AND ENGINEER IF ANY DISCREPANCIES ARE FOUND BETWEEN THE ACTUAL CONDITIONS VERSUS THE DATA CONTAINED IN THE CONSTRUCTION PLANS. ANY COSTS INCURRED AS THE RESULT OF NOT CONFIRMING THE ACTUAL LOCATION (HORIZONTAL/VERTICAL) OF SAID CABLES, CONDUITS, PIPES, AND STRUCTURES SHALL BE BORNE BY THE CONTRACTOR. ADDITIONALLY, THE CONTRACTOR(S) SHALL NOTIFY THE OWNER AND ENGINEER IF ANY ERRORS OR DISCREPANCIES ARE FOUND ON THE CONSTRUCTION DOCUMENTS (PS&E), WHICH NEGATIVELY IMPACT THE PROJECT. THE ENGINEER AND OWNER SHALL BE INDEMNIFIED OF PROBLEMS AND/OR COST WHICH MAY RESULT FROM CONTRACTOR'S FAILURE TO NOTIFY ENGINEER AND OWNER.



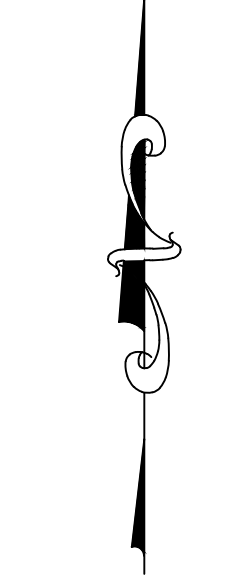
SITE PLAN



CONCRETE FLUME
 N.T.S.



CONCRETE JOINT AT EXISTING ASPHALT
 N.T.S.

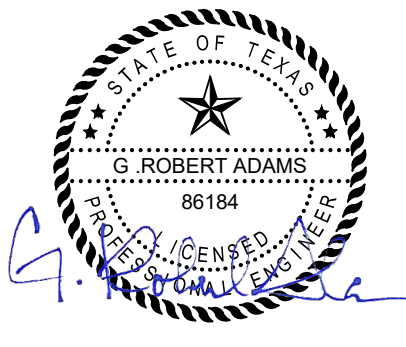


GRAPHIC SCALE
 0 30 60 FEET

LEGEND

PROPOSED FACE AND BACK OF CURB	
PROPOSED LIGHT DUTY CONCRETE PAVEMENT	
PARKING COUNT	

Date	Description	No.
Revisions		
		08-11-2024



LANGAN
 Langan Engineering and Environmental Services, LLC
 1101 ESE Loop 323, Suite 101
 Tyler, TX 75701

T: 903.324.8400 www.langan.com
 TBPE FIRM REG. #F-13709

Project
ROY H. LAIRD HEALTH SCIENCES EDUCATION CENTER

Drawing Title
SITE PLAN - NE PARKING LOT

Project No. 532012701	Drawing No. C2.0
Date 2/15/24	
Drawn By TMC	
Checked By RDM	
Sheet of 1	



Know what's below.
 Call before you dig.

THESE PLANS ARE SUBJECT TO REVIEW & APPROVAL BY JURISDICTIONAL ENTITIES.

Appendix B
IFB 2023-LairdPL008
Health Science Education Center Parking Lot Construction

COMPETITIVE BIDDING FORM

1.1 BID INFORMATION

- A. Bidder: _____
- B. Designated Contact for Bidder: _____
- C. Designated Contact's Phone Number: _____
- D. Project Name: Health Science Education Center Parking Lot Construction
- E. Project Location: 1612 S. Henderson Blvd., Kilgore, TX 75662
- F. Owner: Kilgore College
- G. Architect: Langan Engineering and Environmental Services, LLC, 1101 ESE Loop 323, Suite 101, Tyler, Texas 75701.

1.2 BASE BID

- A. The undersigned, having carefully examined the Invitation for Bid Requirements, Conditions of the Contract, Drawings, Specifications, as prepared by Langan Engineering and Environmental Services, LLC, and all subsequent Addenda, having visited the site, and being familiar with all conditions and requirements of the work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Invitation for Bid Documents, for the stipulated sum of:

1. _____ Dollars (\$_____).

The above amount includes _____ dollars for contingencies.

2. Bid Alternative (asphalt paving surface): _____

1.3 TIME OF COMPLETION

- A. If awarded this contract, the Undersigned hereby agrees to execute the work as follows:

Work can begin _____, and be completed by _____ (Insert dates).

- B. For those materials requiring protection from the elements, contractor shall make necessary provisions for storage on the jobsite. Materials shall be appropriately insured during storage by contractor.
- C. It is imperative that the contractor make efficient use of his time and workers, in the progress of the work to meet the completion dates listed above.

1.4 EXTRA WORK

- A. If extra work is ordered by the Owner, the Undersigned agrees to perform each work for net cost of all materials and labor furnished plus _____% for overhead and profit.

1.5 SUBCONTRACTORS AND SUPPLIES

- A. List any subcontractors to be used and specify the work to be subcontracted.
 - 1. _____
 - 2. _____
 - 3. _____
 - 4. _____
 - 5. _____

1.6 CONTRACTOR'S LICENSE

- A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in Gregg County, Texas, and that all fees, permits, etc., pursuant to submitting the proposal have been paid in full.

1.7 PROPOSER INFORMATION

- A. The undersigned confirms inclusion of information documenting how proposer meets the selection criteria.
 - 1. Cost for Services – listed in sections 1.2 and 1.3 above.
 - 2. Qualification and Reputation of the Bidder – please attach a description of bidder's leadership team and the education/experience of those individuals who would be involved in this project. Include at least three (3) references for construction/renovation projects that have been completed within the past two (2) years.
 - 3. Past Relationship with the College and/or design team – please attach a description of previous projects completed for the College and/or experience in working with MHS Planning on renovation projects.
 - 4. Specific experience in the scope of the proposed project – please attach a description of experience in building/renovating projects that are substantially similar to this project and include at least three additional (3) references for substantially similar projects.

1.8 BID ACCEPTANCE

- A. Firm/Company Name: _____
- B. Address: _____
- C. Phone/Fax: _____
- D. Authorized Signature: _____
- E. Title: _____
- F. Date: _____

Appendix B - Schedule A
ALLOWANCES, ALTERNATES

1.1 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.
- B. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.2 UNIT PRICES:

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Take measurements and compute quantities. Architect/Engineer will verify measurement/quantities.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: If required a schedule of unit prices is included on the CSP Form.
- E. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Architect multiplied by unit sum/price for Work incorporated in or made necessary by the Work.

1.3 CHANGE PROCEDURES

- A. The Conditions of the Contract states that the Owner may order changes in the Work within the general scope of the Contract, consisting of additions, deletions or other revisions. If such revisions cause an increase or decrease in the Construction Managers or a Contractor's cost or time required for performance of the contract, an equitable adjustment may be made and confirmed in writing in the form of a Contract Change
- B. Architect will issue through the Construction manager or General Contractor supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.
- C. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 14 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
- D. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract,

Construction Manager or General Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
- E. On Owner's approval of a work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Construction Manager/ General Contractor on AIA Document G701
- F. Work Change Directive: Architect may issue a Work Change Directive on AIA G714. Change Directive instructs Construction Manager / General Contractor to proceed with change in the Work, for inclusion in a future Change Order.
1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or Contract Time.
 2. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.

1.4 SCHEDULE OF VALUES

- A. The Construction Manager / General Contractor will submit a printed schedule on AIA Form G702 and G703. All contractors to coordinate and support the completion of this information by the CM /GC Coordination:
- B. Submit Schedule of Values within 14 days after the Contractor Agreement or upon Notification to Proceed.
1. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 2. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 3. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
 4. Sub-schedules for Phased Work: Where the work is separated into phases requiring separately phased payments, breakdown schedules showing values associated with each phase
 5. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 6. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.
 7. Forms filled out by hand will not be accepted.
 8. Electronic media printout including equivalent information will be considered in lieu of standard form specified: If reviewed and approved by Architect.

APPENDIX C
ADDENDA CHECKLIST

Bid of: _____
(Bidding Company's Name)

To: Kilgore College
Ref.: Health Science Education Center Parking Lot Construction
IFB No.: 2023-LairdPL008

Ladies and Gentlemen:
The undersigned bidder hereby acknowledges receipt of the following Addenda to the captioned IFB (initial for each if applicable).

It is the bidder's responsibility to make sure they have obtained all addenda. Addenda, if any, will be posted on KC's website at <https://www.kilgore.edu/about/offices/procurement-services>

No. 1 _____ No. 2 _____ No. 3 _____ No. 4 _____ No. 5 _____

If no Addenda's available initial here. _____

Respectfully submitted,

Bidder: _____

By: _____
(Authorized Signature for Bidder)

Printed Name: _____

Title: _____

Date: _____

APPENDIX D
EXECUTION OF OFFER

By signature hereon, bidder offers and agrees to furnish to Kilgore College the products and/or services more particularly described in its bid, at the prices quoted in the bid, and to comply with all terms, conditions and requirements set forth in the IFB documents and contained herein.

By signature hereon, bidder affirms that she/he has not given, nor intends to give at any time hereafter, any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor or service to a public servant in connection with the submitted proposal.

By signature hereon, bidder certifies that the individual signing this document and the documents made part of the IFB is authorized to sign such documents on behalf of the company and to bind the company under any agreements or other contractual arrangements which may result from the submission of bidder's bid.

By signature hereon, bidder affirms that no compensation has been received for participation in the preparation of the specifications for this IFB. (ref. Section 2155.004 *Texas Government Code*).

Bidder represents and warrants that all articles and services quoted in response to this IFB meet or exceed the safety standards established and promulgated under the Federal Occupational Safety and Health Law (Public Law 91-596) and its regulations in effect or proposed as of the date of this solicitation.

By signature hereon, bidder signifies her/his compliance with all federal laws and regulations pertaining to Equal Employment Opportunities and Affirmative Action.

By signature hereon, bidder agrees to defend, indemnify, and hold harmless KC, all of its board members, agents and employees from and against all claims, actions, suits, demands, proceedings, costs and expenses (including reasonable attorneys' fees and court costs), damages, and liabilities, arising out of, connected with, or resulting from any negligent or willful acts or omissions of bidder or any agent, employee, subcontractor, or supplier of bidder in the execution or performance of any agreements or other contractual arrangements which may result from the submission of bidder's bid.

By signature hereon, bidder agrees to abide by and fully comply with KC's smoking policy. Bidder understands that this applies to the project at issue and bidder agrees that all persons working under or for bidder will abide by this policy in all respects.

Bidder: _____ EIN No: _____

Address: _____

Telephone: _____ Email: _____

Office Name & Title (printed) _____

Officer Signature: _____ Date: _____